

SERVICE MANUAL

CASSETTE RECORDER

**SANYO****M9990K**

SPECIFICATIONS

Recording system	AC bias, 4 tracks stereo	Frequency response	50 – 14,000Hz (CrO ₂) 50 – 14,000Hz (FeCr) 50 – 12,000Hz (NORMAL)
Erasing system	DC erase	Output power	3.5W x 2 maximum
Tape speed	4.75 cm/s (1-7/8 i.p.s.)	Power source	DC: 12V "D" (UM-1) x 8 1.5V "AA" (UM-3) x 1 (Clock) 12V Car battery adaptor
Rewind and fast forward time	Rewind: 2 min. (C-60) Fast forward: 3 min. 40 sec. (C-60)	Power consumptions	AC: 120/200/240V 50/60Hz 20W
Frequency range	FM: 88 – 108MHz MW: 530 – 1,605kHz SW1: 2.3 – 7.0MHz SW2: 7.0 – 22.0MHz	Dimensions	490(W) x 123(D) x 295(H) mm (19-3/8" x 4-7/8" x 11-5/8")
Terminal impedance	EXT. MIC: 10k ohms (0.3mV) LINE IN: 2M ohms (100mV) LINE OUT: 18k ohms (0.7V) EXT SP: 6 – 8 ohms HEADPHONES: 8 ohms	Weight	Approx. 6.5 kg (14 lbs. 5 ozs.) including batteries

* Specification subject to change without notice.

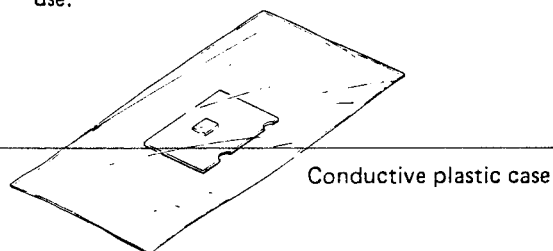
HANDLING & REPAIR OF LSI's

CAUTION

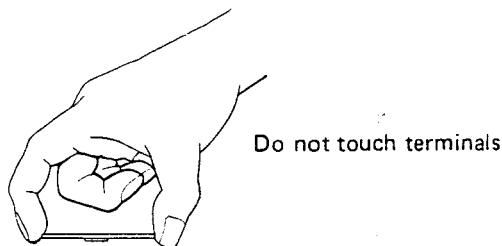
The large-scale integrated circuit (LSI) incorporates in its small size highly sophisticated circuitry. It must be handled with utmost care to protect it against destruction because it works on a very weak current and is highly sensitive to static electricity.

A. PRECAUTIONS FOR LSI-MOUNTED CIRCUIT BOARD

1. Do not take this LSI-mounted circuit board out of the electrically conductive plastic case right before use.



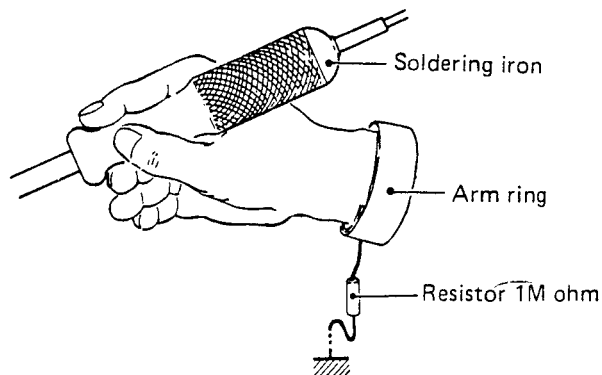
2. When handling this circuit board, hold it at its ends and take care not to touch its foil-pattern and components parts mounted thereon.



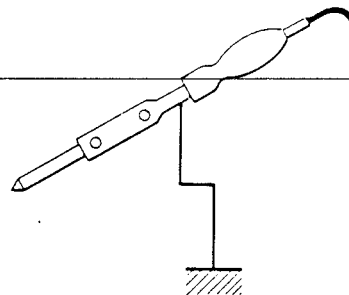
3. The LSI shouldn't be kept in a Hot, high moisture place. Strong magnetism is also detrimental.

B. REPAIR

1. Please be sure to unplug the power cord before setting or taking off an LSI. Do not forget to ground the B-lines (at the one specified spots). Do the same when replacing the printed circuit board. Three parts to be grounded: (at both ends of) electrolytic capacitors C2, C4.
2. Be sure to connect a grounding conductor to every instrument and tool to be employed. (Either at E or G) The engineer who does the repair work should have a grounding conductor attached to his body (he should wear an arm ring connected to a grounding line having a resistance value of 1M ohms) Before handling an LSI, he should touch the B-line and discharge into the earth static electricity charged in his body.



3. AC leakage from the soldering iron being employed should be prevented. It must be less than 1V when the iron is hot. Be sure to ground it before use.



C. MISCELLANEOUS

1. Do not wipe an LSI with a dry cloth. (If necessary, use a cloth impregnated with antistatic agent.)
2. A tester can be used for measuring voltage and amperage. It should not be used for measuring resistance.

D. HANDLING OF P.C.B. ASSEMBLY

1. Place a conductive urethane foam sheet on the repair desk.
2. Do not take it out of an electrically conductive case until immediately before use.
3. Do not touch the patterned surface of the PCB with hand.

If you can not get an arm ring and a conductive urethane foam sheet in your stateside, please order to end of this book address:

HOW TO HANDLE LCD

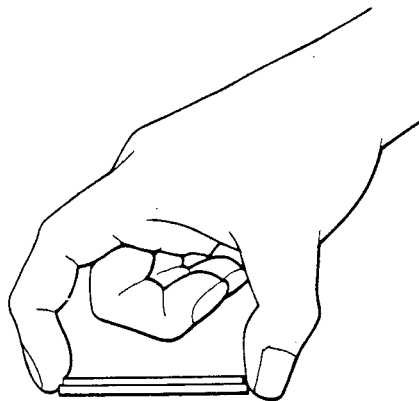
Always Keep LCD (Liquid Crystal Display) fitted with Bias Plate (Deflecting Filter), because LCD is sensitive to ultra-violet rays.

1. Storing of LCD

- a) Store LCD in some dark place until you use it. Be careful that you do not keep LCD under direct rays of the sun or other strong light sources.
- b) Keep LCD in 0°C (32°F) to 50°C (122°F) temperature and in low humidity.

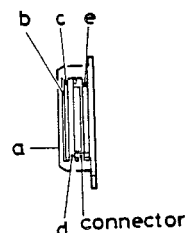
2. How to Hold LCD

- a) When holding LCD, you should hold both ends of the package carefully with your fingers. Don't touch the surface of the terminal.
- b) Be careful that LCD surface is not subjected to strong pressure or struck.

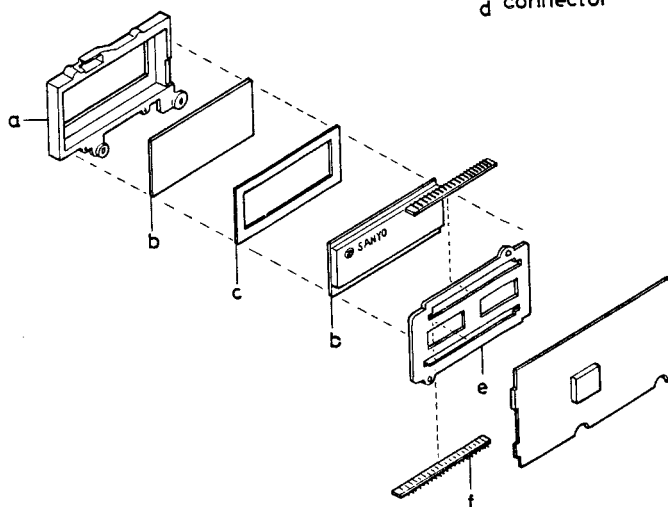


3. Precautions in Repairing

- a) When you change an old LCD for a new one, give attention to the up and down sides for correct fitting directions.
- b) Don't touch the surface of the terminal with your tester or other tools.
- c) Be careful to keep LCD away from static electricity the same as you do for Printed Circuit Board with LSI (Large Scale Integrated Circuit).



- Ⓐ BRACKET FRAME
- Ⓑ BIAS PLATE (Deflecting Filter)
- Ⓒ SPACER
- Ⓓ LCD
- Ⓔ SPACER
- Ⓕ CONNECTOR



PACE READJUSTING OF THE CLOCK

You scarcely need readjust the pace of Sanyo's Clock-Radios, because each product has been severely and precisely adjusted on the assembling and testing line with Quartz Timer (Pacemeasuring machine equipped exclusively for Sanyo timepieces with LCD). However, if you want to change some parts such as LCD, Trimmer and so on, you may take the following steps:

1. Preparation Before Readjusting

Turn off the radio switch as the first step.

- 1) Give your Clock-Radio a rest in a room of $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$ ($73^{\circ}\text{F} \pm 5^{\circ}\text{F}$) temperature for about 1 hour.

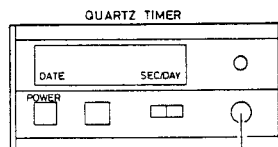
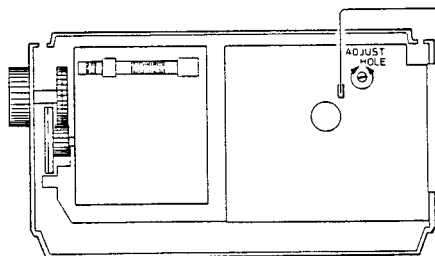
Don't start any repairing work while LCD and Trimmer are in unstable condition, because they are sensitive to heat, and may change their oscillating frequency.

- 2) As you see, Trimmer for pace readjusting is rather small. Therefore handle it carefully with a tiny screw driver with minus-point (-).
- 3) DC $1.5\text{V} \pm 0.1\text{V}$ power source is recommended to supply power to the clock.

3. How to Readjust

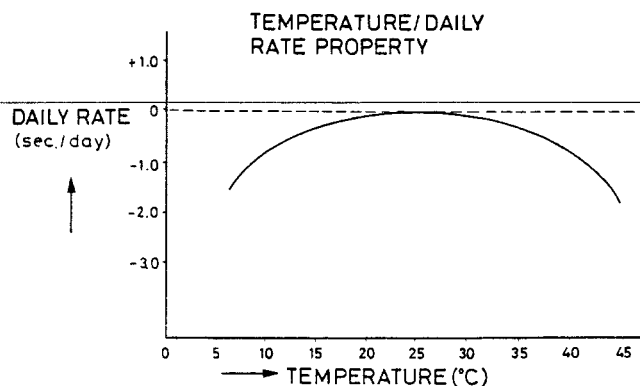
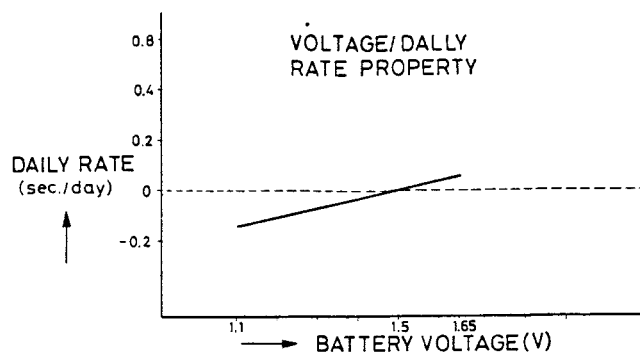
- 1) When Using a Quartz Timer

Choose a sensor which can measure up to 32.768kHz of crystal oscillation, and connect it to Quartz Timer. Then operate the Trimmer to fix the daily rate to between $+0.2$ and -0.1 sec./day.



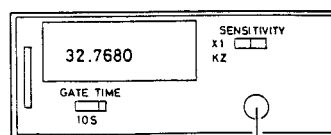
SENSOR
1.5V
QUARTZ
BATT

2. Special Properties of the Clock



HANDLING OF TRIMMER AND CRYSTAL

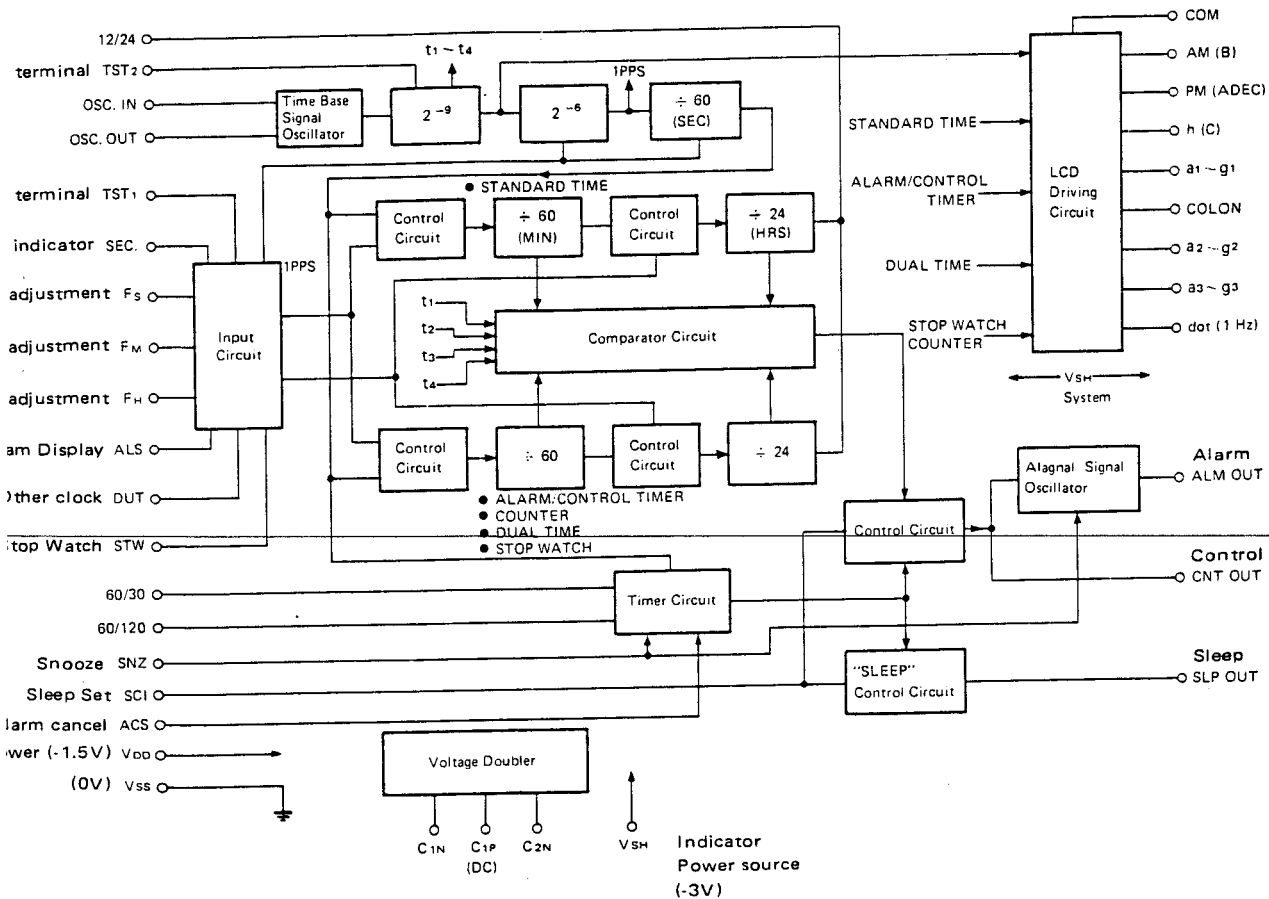
1. Never apply strong force or impact to the trimmer and crystal.
2. When handling crystal leads, hold leads and bend carefully so as not to apply force to lead roots.
3. Solder trimmer and crystal at 270°C , and within 3 seconds.
4. After adjusting and mounting, do not touch the parts.



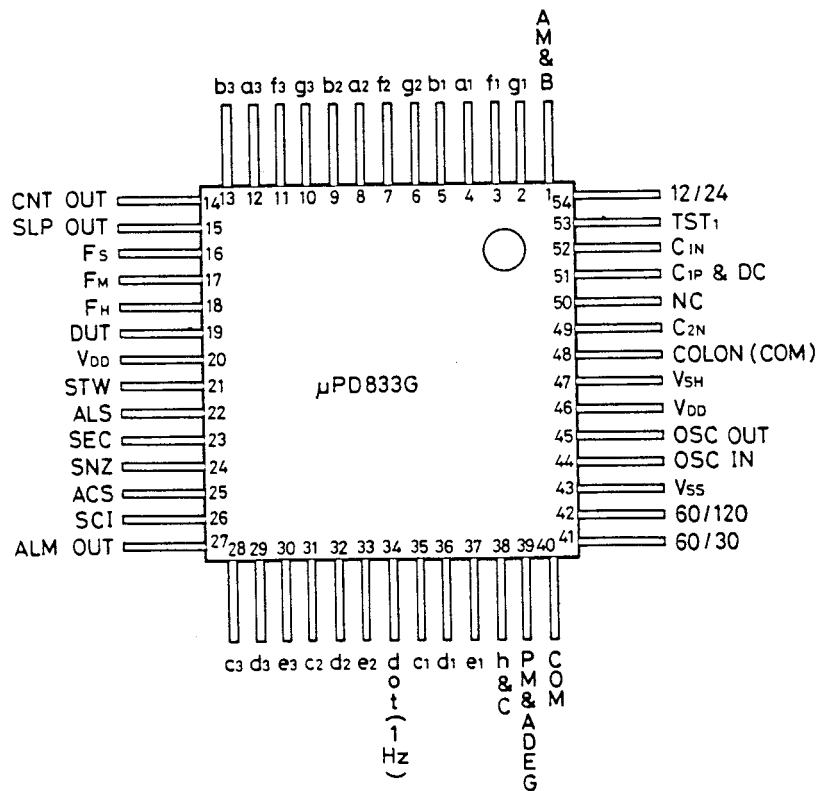
4. When using frequency counter



BLOCK DIAGRAM (CLOCK)



TERMINAL OF CLOCK LSI



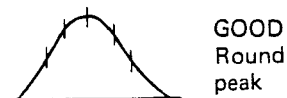
TUNER ADJUSTMENT

ADJUSTMENT OF AM FREQUENCY COVERAGE

- (1) Adjust the AM frequency coverage at 530 kHz and 1600 kHz.
- (2) Set the dial to 530 kHz, and turn L109 to adjust to 530 kHz.
- (3) Set the dial to 1600 kHz, and turn CT104 to adjust to 1600 kHz.
- (4) Repeat steps (2) and (3) to adjust to each frequency.

ADJUSTMENT OF FM IF

- (1) The IF waveform should be mirror symmetrical and the wave center should be adjusted to 10.7 MHz as far as possible.



- (2) S-curve should be vertically symmetrical around the center of IF waveform.

ADJUSTMENT OF FM FREQUENCY COVERAGE

- (1) Keep AFC switch turned off.
- (2) Adjust coverage at 88MHz and 108 MHz.

ADJUSTMENT OF TUNING INDICATOR

- (1) The color of indicator LED is green.
- (2) Adjust turning indicator after FM and AM tracking.
- (3) Receive 98 MHz in FM band, and adjust SVR350 to an extent that LED is dimly lit at an input of 20dB.
- (4) Do not turn SVR350 until LED illumination becomes bright, otherwise the actual lighting sensitivity may be discrepant.
- (5) Rating of lighting sensitivity

FM 98 MHz	: 20 dB $\pm$ 5 dB
AM 1400 kHz	: 68 dB to 80 dB

ADJUSTMENT OF FM MPX SECTION

[1] CONDITIONS OF ADJUSTMENT AND MEASUREMENT

- (1-1) Apply modulation input into FM SG from stereo signal generator (SSG). And adjust modulation of SG so that the pilot signal be 7.5 kHz dev. (10% mod.) and the stereo signal be, with SSG at MAIN, 22.5 kHz dev. (30% mod.). Modulation frequency should be 1000 Hz.
- (1-2) Keeping the output signal switch of SSG at MAIN, set reception frequency to 98 MHz and tune in to it.
Hereafter "tuning" means this state.
- (1-3) During adjustment, keep AFC switch turned off.
- (1-4) Hold mode switch at STEREO.

[2] 19 KHZ ADJUSTMENT (V.C.O. ADJUSTMENT)

- (2-1) In FM stereo mode, tune in to 98 MHz at 60 dB.
- (2-2) Connect the earth wire and hot wire of frequency counter to TP4 and TP5, respectively.
- (2-3) Unmodulate FM input. (To unmodulate, turn off both MAIN & SUB signal switch and PILOT signal switch of SSG.)
- (2-4) With FM input unmodulated, adjust SVR502 so that the counter frequency be $19 \text{ kHz} \pm 100 \text{ Hz}$.

[3] INSPECTION OF V.C.O. KILLER

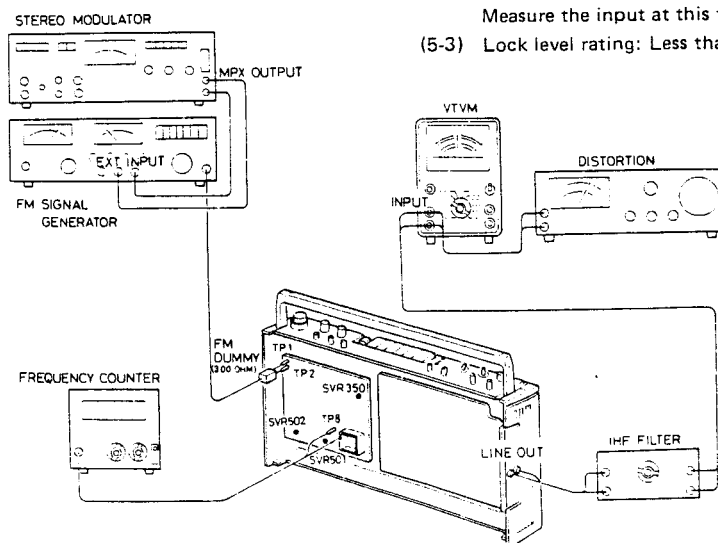
- (3-1) After the 19 kHz adjustment, check the following items.
- (3-2) Set mode switch to MONO, and see that 19 kHz changes to 0 Hz.
- (3-3) With mode switch at STEREO, set band switch to AM, and see that 19 kHz changes to 0 Hz.

[4] ADJUSTMENT OF SEPARATION

- (4-1) Tune in to FM stereo signal (with MAIN & SUB signal and PILOT signal switches turned on) at an input of 60 dB.
- (4-2) Keeping treble control at MIN and bass at center, turn VR to adjust the output to standard output.
- (4-3) Left side separation
Turn on the LEFT side of output switch. This output is A. And the leakage output generated in the right side amplifier is B. Make sure the difference between A and B is more than 20 dB.
- (4-4) After making sure the output difference is more than 20 dB, turn on AFC switch and see that the output difference is also more than 20 dB.
- (4-5) Right side separation
In the same way as checking the left side separation, check the output difference caused in the left side amplifier.
- (4-6) Since separation is of non-adjusting type, adjust IF waveform and S-curve with special care.
If the separation is inferior, check the IF waveform and T301 adjustment again; if the separation is ruined by turning on AFC, check again if the center of S-curve is deviated.
- (4-7) Separation rating
400 Hz, 1000 Hz : More than 20 dB in both L & R chs.
10 kHz : More than 10 dB
- (4-8) To check the 10 kHz separation, set the VR to maximum position and turn the treble control to adjust to the standard output.

[5] CHECKING OF PILOT LAMP LIGHTING SENSITIVITY
(LOCK LEVEL)

- (5-1) The color of indicator LED is red.
- (5-2) Tune in under the same condition as above. Once reduce SG ATT to 0 dB and then increase gradually until pilot lamp lights up. Measure the input at this time.
- (5-3) Lock level rating: Less than 26 dB



TUNER ADJUSTMENT

MW ADJUSTMENT

VOLUME ADJUSTMENT							
Step	Adjusting Circuit	Connections		SG frequency	Position of tuning dial	Adjustment	VTVM Oscilloscope
		Input	Output				
1	I.F.T.	Connect sweep generator to Test Loop.	Connect oscilloscope to EXT. SP terminals	455 KHz (400 Hz 30% modulation)	Low end of dial scale under no station signal.	T306,T307, T308	MAX.
2	OSC.	Connect AM SG to Test Loop.	Connect VTVM to speaker terminals.	505 KHz (400 Hz 30% modulation)	Low end of dial scale	L111	MAX.
3				1650 KHz (400 Hz 30% modulation)	High end of dial scale	CT8	
4	ANT.	Connect AM SG to Test Loop.	Connect VTVM to speaker terminals.	600 KHz (400 Hz 30% modulation)	600 KHz on dial scale	L106b	MAX.
5				1400 KHz (400 Hz 30% modulation)	1400 KHz on dial scale	CT5	
6	Repeat adjustments.						

PREPARE: 1. Set the dial pointer to very left line of dial scale.
2. Connect sweep generator, AM SG, VTVM and oscilloscope.
3. Selector switch to "MW"
4. Use a screwdriver with plastic grip for all adjustments.

SW1 ADJUSTMENT

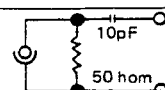
ANT. Adjustment							
Step	Adjusting Circuit	Connections		SG frequency	Position of tuning dial	Adjustment	VTVM Oscilloscope
		Input	Output				
1	OSC.	Connect AM SG to Test Loop.	Connect VTVM to speaker terminals.	2.2 MHz (400 Hz 30% modulation)	Low end of dial scale	L110	MAX.
2				7.3 MHz (400 Hz 30% modulation)	High end of dial scale	CT7	
3	ANT.	Connect AM SG to Test Loop.	Connect VTVM to speaker terminals.	2.5 MHz (400 Hz 30% modulation)	2.5M Hz on dial scale	L106a	MAX.
4				6.8 MHz (400 Hz 30% modulation)	6.8M Hz on dial scale	CT4	
5	Repeat adjustments.						

PREPARE: 1. Set the dial pointer to very left line of dial scale.
2. Connect sweep generator, AM SG, VTVM and oscilloscope.
3. Selector switch to "SW1".
4. Use a screwdriver with plastic grip for all adjustments.
5. Set the Fine Tuning to mechanical center.

SW2 ADJUSTMENT

Step	Adjusting Circuit	Connections		SG frequency	Position of tuning dial	Adjustment	VTVM Oscilloscope
		Input	Output				
1	OSC.	Connect AM SG. to ANT terminal through IRE dummy.	Connect VTVM to EXT. SP. terminals.	6.8 MHz (400 Hz 30% modulation)	Low end of dial scale.	L109	MAX.
2				22.7 MHz (400 Hz 30% modulation)	High end of dial scale.	CT6	
3	ANT.	Connect AM SG. to ANT terminal through IRE dummy.	Connect VTVM to EXT. SP. terminals.	8.0 MHz (400 Hz 30% modulation)	8.0M Hz on dial scale.	L105	MAX.
4				21.5 MHz (400 Hz 30% modulation)	21.5M Hz on dial scale.	CT3	
5	Repeat adjustments.						

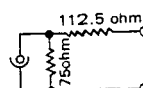
PREPARE: 1. Set the dial pointer to very left line dial scale.
2. Connect signal generator to dummy antenna.
3. Use screwdriver with plastic grip for all adjustments.
4. Selector switch to "SW2"
5. Set the Fine Tuning to mechanical center.
6. Use a Dummy antenna as follow.



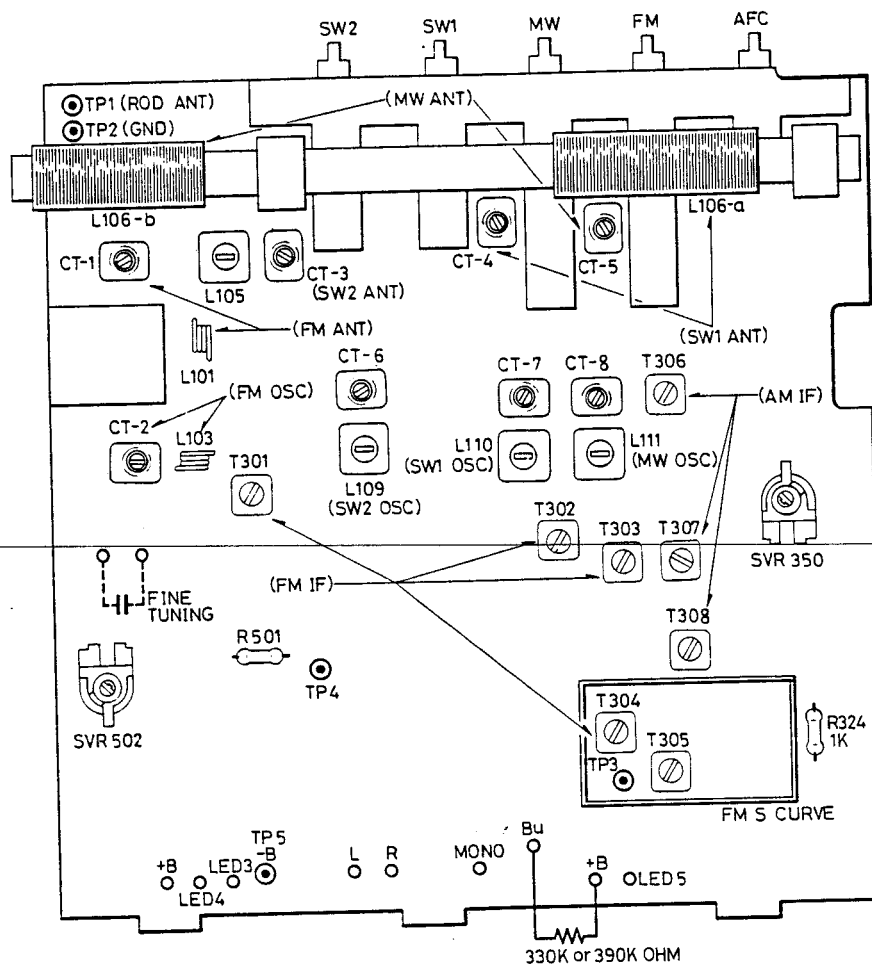
FM ADJUSTMENT

Step	Adjusting Circuit	Connections		SG frequency	Position of tuning dial	Adjustment	VTVM Oscilloscope
		Input	Output				
1	I.F.	Connect sweep generator to FM TP1 (H) & TP2 (E)	Connect oscilloscope to R319 (H) & shield plate (E).	10.7 MHz (0% modulation)	Near max. capacitance tuning gang under no station signal.	T301~T304	
2	Ratio Det.		Connect oscilloscope to R324 (H) & shield plate (E).			T305	
3	OSC.	Connect FM SG to TP-1 (H) & TP-2(E)	Connect VTVM to speaker terminal.	87.0 MHz (400 Hz 30% modulation)	Low end of dial scale	L103	MAX.
4				109.0 MHz (400 Hz 30% modulation)	High end of dial scale	CT2	
5	ANT.	Connect FM SG. to TP-1 (H) & TP-2(E)	Connect VTVM to speaker terminal.	90.0 MHz (400 Hz 30% modulation)	90.0 MHz on dial scale	L101	MAX.
6				106.0 MHz (400 Hz 30% modulation)	106.0 MHz on dial scale	CT1	
7	Repeat adjustments.						

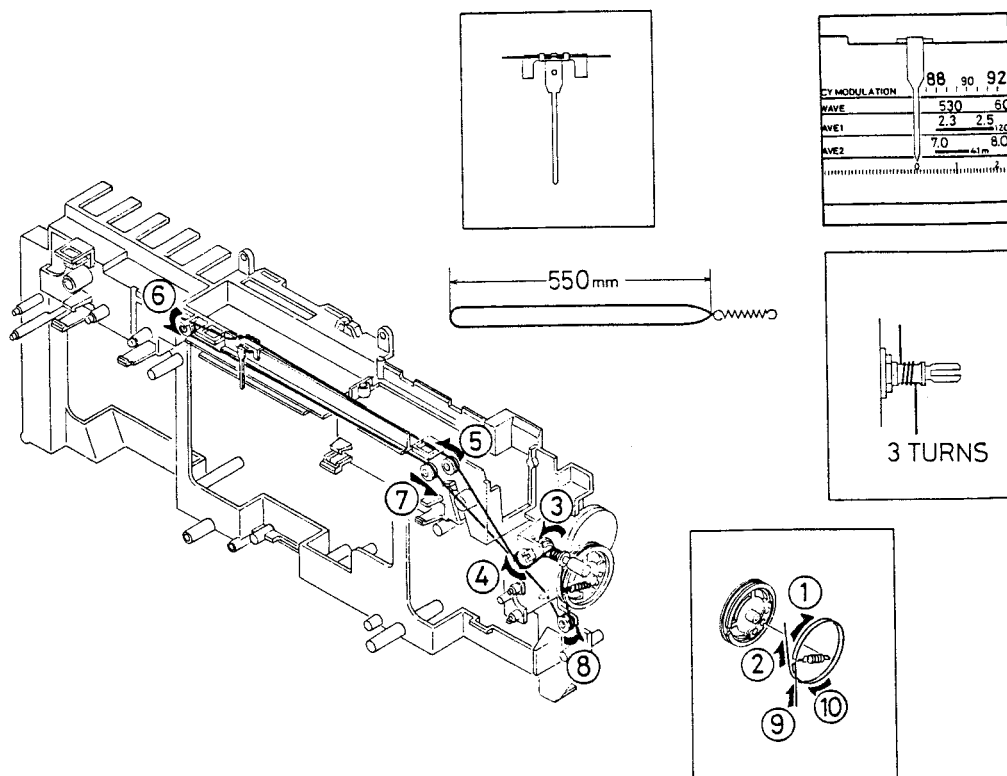
PREPARE: 1. Set the dial pointer to very left line of dial scale.
2. Connect sweep generator, FM SG, VTVM and oscilloscope. FM antenna input impedance is 75 ohm.
3. Use a screwdriver with plastic grip for all adjustments.
4. AFC switch OFF.



PARTS LOCATION



DIAL CORD STRINGING



AMPLIFIER ADJUSTMENT

PREPARATION

Supply voltage: 12 volts

Tone controls (bass, treble): Mechanical center

Switches

Function switch : TAPE
 AUTO switch : OFF
 Tape switch : NORMAL
 Mode switch : STEREO

(1) ADJUSTMENT OF PLAYBACK GAIN

Set volume controls to minimum.

Play back test tape (1 kHz, 0 dB), and adjust SVR701 (20 KB) so that the outputs from line output terminals of both right and left channels be equal to each other.

(2) ADJUSTMENT OF METER

Carry out after playback gain adjustment.

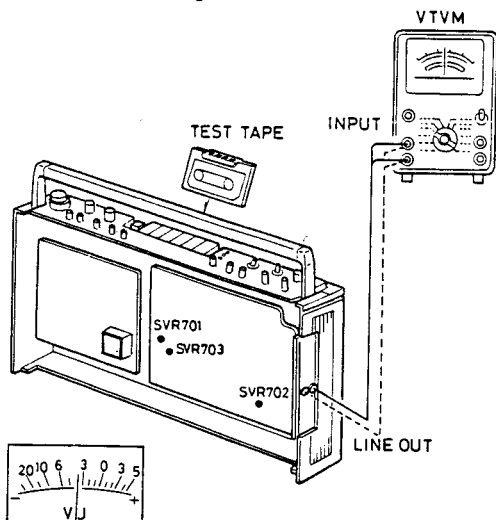
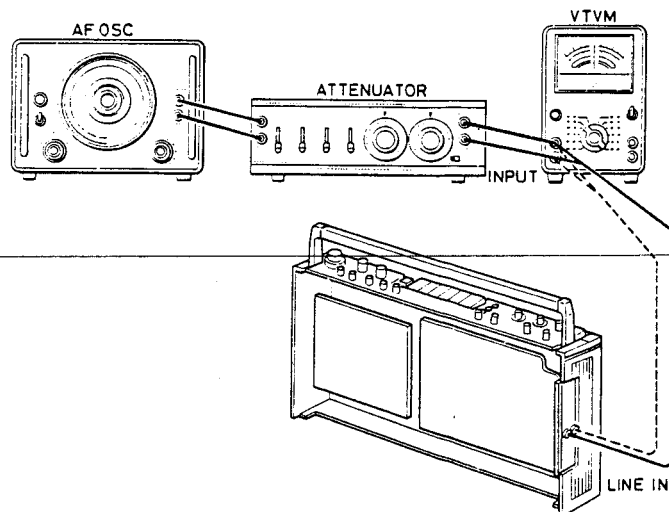
Play back test tape (1 kHz, 0 dB), reduce volume controls (simultaneously R and L sides) until the left channel meter indicates -1 VU.

Adjust SVR703 (100 KB) so that the right channel meter reading be equal to the left channel reading.

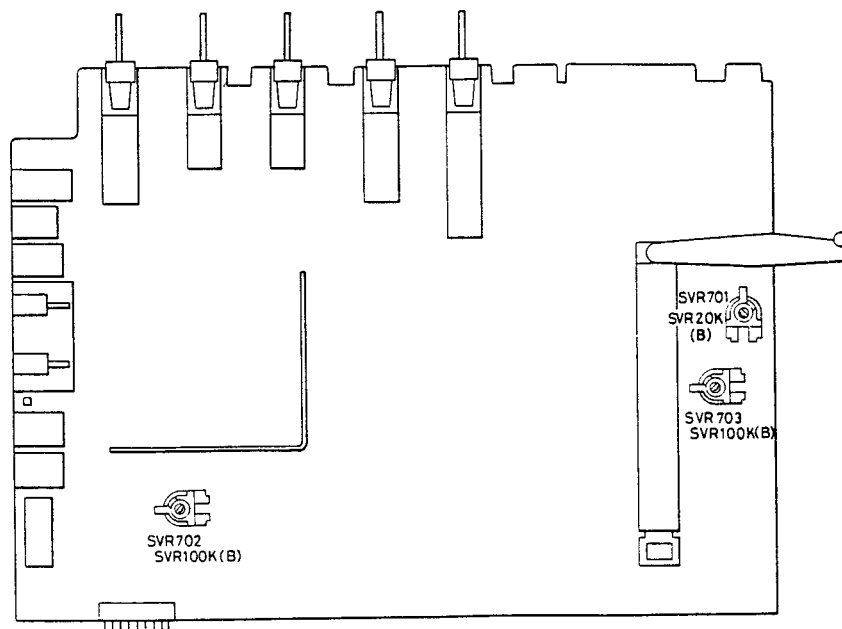
(3) ADJUSTMENT OF RECORDING GAIN

Set volume controls to minimum.

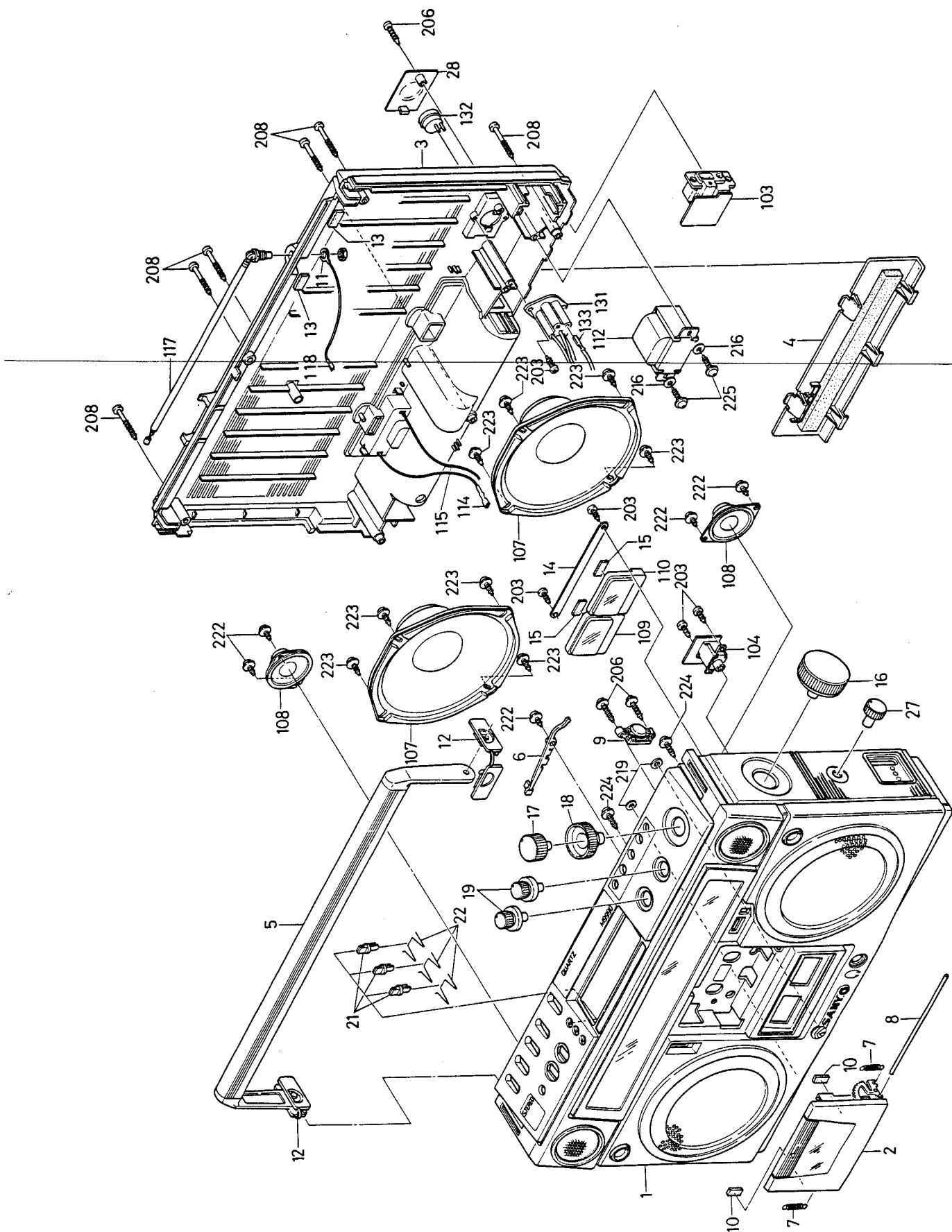
Load with blank tape, set in record mode, and pass a signal of 1 kHz, -30 dB (50 mV) into line input terminal (LINE IN), and one of 1 kHz, -80 dB (0.15 mV) into MIC terminal. Connect vacuum tube voltmeter (VTVM) to the collectors of transistors Q805 and Q905, and adjust SVR702 (100 KB) so that the output from both right and left channels be equal to each other.



PARTS LOCATION



EXPLODED VIEW (CABINET)



PARTS LIST

Key No.	Part No.	Description	Q'ty	Key No.	Part No.	Description	Q'ty
PACKING				CHASSIS			
	141 6 132T 98200	Individual Carton	1	75	141 2 581T 11000	Gear	1
	141 6 410T 19201	Instruction Manual	1	76	141 2 581T 11100	Gear	1
	141 6 144T 51400	Foam Plastic Case	1	77	141 2 538T 09800	Drum	1
	141 6 144T 51600	Foam Plastic Case	1	78	141 2 855T 26100	Spring Coil, Gear	1
	141 6 231T 45705	Inner Poly Cover, Set	1	79	141 2 851T 06300	Spring Coil, Drum	1
	141 6 231T 20350	Inner Poly Cover, Instruction B.	1	80	141 2 340T 00200	Rope	1
	141 6 316T 98700	Pad, Handle	1	81	141 0 153T 44601	Escutcheon Assy, LCD	1
	141 2 171T 09500	Handle	1	82	141 2 853T 55400	Spring Plate, R/P	1
	141 2 246T 40500	Sheet	1	83	141 2 385T 02200	Bracket, Microphone	2
	141 6 311T 03400	Top Pad	2	84	141 2 511T 15300	Pointer	1
	141 0 385T 02900	Bracket Mic Assy	2	85	141 0 146T 19502	Dial Scale Assy	1
	141 6 132T 98300	Inner Poly Cover, Mic Stand	1				
	141 6 231T 10200	Inner Poly Cover, Mic Stand	2				
ACCESSORIES				ELECTRICAL PARTS			
	4 241T 12671	Cassette Tape	1	105	4 612T 12000	Pilot Lamp	1
	4 153T 10700	Microphone	1	106	4 231T 79600	Switch, Dial	1
	4 153T 10800	Microphone with Remote	1	107	4 151T 28500	Speaker, Woofer 16cm	2
	4 243T 13001	Lead Cord Assy	1	108	4 151T 17873	Speaker, Tweeter 5cm	2
	4 243T 79100	Power Cord	1	109	4 511T 10700	Meter, VU	1
	4 243T 76401	Power Cord } or	1	110	4 511T 10771	Meter, VR/Battery	1
	4 243T 11500	Power Cord	1	111	4 235T 56200	Socket, 9P	1
	4 236T 11201	Plug Assy	1	112	4 251T 92900	Power Trans	1
CABINET				113	4 153T 10500	Microphone	2
1	141 0 111T 37402	Cabinet Assembly	1	114	4 243T 12807	Lead, (-)	1
2	141 0 124T 22522	Top Lid Assembly	1	115	4 243T 12808	Lead, (+)	1
3	141 0 126T 26202	Back Lid Assembly	1	116	141 2 464T 08700	Fixer	2
4	141 0 128T 13200	Battery Lid Assembly	1	117	4 244T 03200	Telescopic Rod Antenna	1
5	141 0 171T 14600	Handle Assembly	1	118	4 235T 34600	Socket, Rod Antenna	4
6	141 2 742T 10500	Lever, Eject	1	119	4 257T 31301	Antenna Coil Assembly	1
7	141 2 855T 06200	Spring Coil, Top Lid	2	120	141 2 382T 11000	Terminal, Clock	1
8	141 2 753T 52000	Shaft, Top Lid	1	121	4 235T 58900	Socket, Clock 12P	1
9	141 0 581T 10900	Gear Assembly, Top Lid	1	126	4 970T 00271	LCD	1
10	141 2 447T 62000	Cushion, 15x3x2	2	127	4 400T 03100	Connector	2
11	123 2 472R 11100	Lug	1	128	4 243T 12803	Lead, Yellow	1
12	141 2 271T 14900	Bracket, Handle	2	129	4 612T 11001	Lamp Assembly	1
13	141 2 447T 15400	Cushion, 10x10x3t	2	130	4 960T 00271	Bias Plate	1
14	141 2 373T 06600	Bracket, Meter	1	131	4 235T 33200	Socket, AC Select	1
15	141 2 447T 65000	Cushion, 10x30x2t	4	132	4 236T 09909	Plug Assy	1
16	141 2 163T 55500	Rotary Knob, Tuning	1	133	141 2 382T 03100	Terminal	4
17	141 2 163T 45601	Rotary Knob, Volume Right	1	134	4 224R 20700	Fine Tuning	1
18	141 2 163T 45730	Rotary Knob, Volume Left	1	135	4 237T 07671	Terminal Board, EXT ANT	1
19	141 0 163T 45803	Rotary Knob Assembly, Tone	2	136	4 237T 05800	Lug	1
20	141 2 162T 15200	Lever Knob, Clock	2	137	4 252T 06600	Choke Coil	1
21	141 2 161T 56900	Push Button, Clock	3				
22	141 2 852T 51500	Spring Wire, Clock	3	HARDWARE			
23	141 2 162T 15300	Lever Knob	1	201		Pan Head Screw, 3x6mm	6
24	141 2 157T 31700	Inlay	4	202		Flat Head Screw, 2.6x4mm	26
25	141 2 157T 31800	Inlay, Eject	1	203		Tapping Screw, 3x8mm	7
26	141 2 157T 31830	Inlay, Record	1	204		Tapping Screw, 3x10mm	16
27	141 2 163T 53200	Rotary Knob, FINE Tuning	1	205		Tapping Screw, 3x12mm	2
28	141 2 132T 03800	Sign Window, Voltage Select	1	206		Tapping Screw, 3x16mm	5
CHASSIS				207		Tapping Screw, 3x18mm	2
51	141 2 161T 56700	Push Button, Band Select	4	208		Tapping Screw, 3x20mm	6
52	141 0 162T 14000	Lever Knob Assembly, Switch	5	209		Tapping Screw, 3x25mm	3
53	141 2 241T 13200	Veil	2	210		Tapping Screw, 3x45mm	5
54	141 2 322T 46000	Shield Plate, Clock	1	211		Nut, 3mm	2
55	141 2 361T 15200	Bracket, Volume	1	212		Hexagon Bolt, 2.6x12mm	1
56	141 2 365T 41200	Bracket, Switch	1	213		Washer, 3x8x0.5mm	1
57	141 2 445T 11801	Rubber Cushion, Lamp	1	214		Washer, 3x8x1mm	1
58	141 2 114T 01700	Frame, Clock	1	215		Washer, 3x10x0.5mm	2
59	141 2 352T 33900	Spacer, Clock	1	216		Washer, 3x16x1mm	2
60	141 2 352T 34000	Spacer, Clock	1	217		External "E" Ring, 2mm	2
61	123 2 411R 10900	Plate Nut	1	218		External "E" Ring, 4mm	1
62	141 2 367T 31501	Bracket Socket	1	219		Fiber Washer, 3x12x1mm	2
63	123 2 472R 10200	Lug	2	220		Pan Head Screw with Washer & Spring Washer, 1.4x5mm	4
64	141 2 246T 50400	Sheet	2	221		Pan Head Screw with Spring Washer, 3x4mm	1
65	141 2 742T 25100	Lever, R/P	1	222		Tapping Screw with Washer, 3x6mm	5
66	123 2 566R 12000	Tuning Shaft	2	223		Tapping Screw with Washer, 3x8mm	8
67	141 2 363T 08700	Bracket, VC	1	224		Tapping Screw with Washer, 3x12mm	2
68	141 0 311T 30300	Chassis Assy	1	225		Tapping Screw with Washer, 3x14mm	2
73	141 0 566T 08400	Tuning Shaft Assembly	1				
74	141 2 415T 01200	Hexagon Nut	1				

PARTS LIST

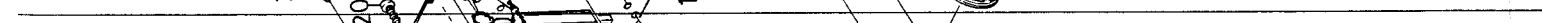
Key No.	Part No.	Description	Q'ty	Key No.	Part No.	Description	Q'ty
VOLUME PCB ASS'Y				AMP PCB ASS'Y			
101	141 4 230T 73100 4 222T 67200 4 222T 67300	P.C. Board Assembly, Volume Variable Resistor, Volume Variable Resistor, Bass/Treble	1 1 2	RESISTOR			
R842,942		Carbon 10K ohm $\pm 10\%$ $\frac{1}{4}W$	2	R803,903		Carbon 2.2M ohm $\pm 10\%$ $\frac{1}{4}W$	2
R845,945		Carbon 2.2K ohm $\pm 10\%$ $\frac{1}{4}W$	2	R809,909		Carbon 1M ohm $\pm 10\%$ $\frac{1}{4}W$	2
R844,944		Carbon 1.5K ohm $\pm 10\%$ $\frac{1}{4}W$	2	R806,906		Carbon 820K ohm $\pm 10\%$ $\frac{1}{4}W$	2
		RESISTORS		R818,918		Carbon 560K ohm $\pm 10\%$ $\frac{1}{4}W$	2
				R839,939		Carbon 470K ohm $\pm 10\%$ $\frac{1}{4}W$	2
				R817,917		Carbon 820K ohm $\pm 10\%$ $\frac{1}{4}W$	2
				R824,924		Carbon 270K ohm $\pm 10\%$ $\frac{1}{4}W$	4
				850,950			
				R816,916		Carbon 220K ohm $\pm 10\%$ $\frac{1}{4}W$	4
				831,931			
				R813,913		Carbon 100K ohm $\pm 10\%$ $\frac{1}{4}W$	6
				836,936			
				749,706			
				R849,702		Carbon 82K ohm $\pm 10\%$ $\frac{1}{4}W$	4
				703,704			
				R751		Carbon 56K ohm $\pm 10\%$ $\frac{1}{4}W$	1
				R812,912		Carbon 47K ohm $\pm 10\%$ $\frac{1}{4}W$	5
				823,923			
				748			
				R953,747		Carbon 39K ohm $\pm 10\%$ $\frac{1}{4}W$	2
				R822,922		Carbon 27K ohm $\pm 10\%$ $\frac{1}{4}W$	2
				R808,908		Carbon 22K ohm $\pm 10\%$ $\frac{1}{4}W$	2
				R841,941		Carbon 18K ohm $\pm 10\%$ $\frac{1}{4}W$	2
				R827,927		Carbon 12K ohm $\pm 10\%$ $\frac{1}{4}W$	2
				R826,926		Carbon 10K ohm $\pm 10\%$ $\frac{1}{4}W$	6
				851,951			
				712,714			
				R754		Carbon 100K ohm $\pm 10\%$ $\frac{1}{4}W$	1
				R360		Carbon 390K ohm $\pm 10\%$ $\frac{1}{4}W$	1
				R949		Carbon 82K ohm $\pm 10\%$ $\frac{1}{4}W$	1
				R820,920		Carbon 150K ohm $\pm 10\%$ $\frac{1}{4}W$	2
				R814,914		Carbon 8.2K ohm $\pm 10\%$ $\frac{1}{4}W$	2
				R804,904		Carbon 6.8K ohm $\pm 10\%$ $\frac{1}{4}W$	5
				805,905			
				718			
				R811,911		Carbon 4.7K ohm $\pm 10\%$ $\frac{1}{4}W$	5
				726,727			
				709			
				R724,852		Carbon 3.9K ohm $\pm 10\%$ $\frac{1}{4}W$	3
				952			
				R819,919		Carbon 3.3K ohm $\pm 10\%$ $\frac{1}{4}W$	4
				708,722			
				R801,901		Carbon 2.2K ohm $\pm 10\%$ $\frac{1}{4}W$	6
				821,921			
				725,705			
				R825,925		Carbon 1.5K ohm $\pm 10\%$ $\frac{1}{4}W$	2
				R802,902		Carbon 1.2K ohm $\pm 10\%$ $\frac{1}{4}W$	2
				R833,933		Carbon 1K ohm $\pm 10\%$ $\frac{1}{4}W$	5
				835,935			
				707			
				R828,928		Carbon 820 ohm $\pm 10\%$ $\frac{1}{4}W$	2
				R717		Carbon 470 ohm $\pm 10\%$ $\frac{1}{4}W$	1
				R846,946		Carbon 390 ohm $\pm 10\%$ $\frac{1}{4}W$	2
				R830,930		Carbon 330 ohm $\pm 10\%$ $\frac{1}{4}W$	5
				710,711			
				713			
				R720		Carbon 220 ohm $\pm 10\%$ $\frac{1}{4}W$	1
				R834,934		Carbon 120 ohm $\pm 10\%$ $\frac{1}{4}W$	2
				R716		Carbon 82 ohm $\pm 10\%$ $\frac{1}{4}W$	1
				R807,907		Carbon 56 ohm $\pm 10\%$ $\frac{1}{4}W$	5
				832,932			
				733			
				R838,938		Carbon 33 ohm $\pm 10\%$ $\frac{1}{4}W$	2
				R752		Carbon 330K ohm $\pm 10\%$ $\frac{1}{4}W$	1
				R829,929		Carbon 5.6K ohm $\pm 10\%$ $\frac{1}{4}W$	2
				R755		Carbon 270 ohm $\pm 10\%$ $\frac{1}{4}W$	1
				R715		Carbon 56 ohm $\pm 10\%$ $\frac{1}{4}W$	1
				R721		Carbon 180 ohm $\pm 10\%$ $\frac{1}{4}W$	1
				R810,910		Carbon 22 ohm $\pm 10\%$ $\frac{1}{4}W$	2
				R728		Carbon 10 ohm $\pm 10\%$ $\frac{1}{4}W$	1
				R723		Carbon 10 ohm $\pm 10\%$ $\frac{1}{4}W$	1
				R719		Carbon 8.2 ohm $\pm 10\%$ $\frac{1}{4}W$	1
				R10		Carbon 1M ohm $\pm 10\%$ $\frac{1}{4}W$	1
				R840,940		Carbon 2.7K ohm $\pm 10\%$ $\frac{1}{4}W$	2
AMP PCB ASS'Y							
102	141 4 230T 72972 141 2 464T 08700 4 231T 74300 4 231T 74400 4 231T 74500 4 231T 74600 4 231T 65200 4 231T 79800 4 235T 57300 4 235T 38000 4 222T 39578	P.C. Board Assembly, AMP Fixer Switch, Mono-Stereo/Side-Auto Switch, Nor-FeCr-Cr Switch, Tape-Radio-Sleep Switch, R/P Switch, Beat Switch, Sleep Time Set Socket, Line In-Out Socket, Ext. SP, Microphone Volume	1 3 2 1 1 1 1 1 1 3 3				
SVR701 702	4 252T 01015 4 253T 04200 4 258T 07100 4 236T 10576 4 235T 37900 4 235R 15700 123 2 411R 10900 4 252T 06700 4 236T 10279 141 2 464T 24100 141 2 368T 19500	Low Frequency Choke Hi Frequency Choke OSC Coil Plug 9P Socket, Microphone Socket, Remote Plate Nut, Remote Choke Plug, 12P Fixer Heat Sink IC BA532 S2	2 1 1 1 1 1 1 1 1 1 1 2				
IC801, 901		Transistor 2SC1571 G or 2SC693	2				
Q802,902		Transistor 2SC1740 R,S LN	2				
Q801,901		Transistor 2SC536G	4				
Q804,904							
806,906		Transistor 2SC536 F	4				
Q803,903							
805,905		Transistor 2SA608 F	1				
Q703		Transistor 2SD612E	2				
Q704,705		Transistor 2SB187 RED	1				
Q701		Transistor 2SC945 Q	2				
Q702,706		Diode DS442	6				
D701,702							
802,902		Diode 1S188 AM	4				
703,704							
D803,903		Diode DS442	11				
804,904							
D709,711							
712,801							
901,717							
708,710							
713,716							
718							
D715		Diode MA26 W	1				
D719		Zener Diode BZ061 JRC	1				

PARTS LIST

Key No.	Part No.	Description	Q'ty	Key No.	Part No.	Description	Q'ty
AMP PCB ASS'Y				TUNER PCB ASS'Y			
C705		CAPACITORS		122	141 4 230T 82800	P.C. Board Assembly, Tuner	1
C710		Electrolytic 2200 μ F 25V	1	L109	4 258T 08131	OSC Coil	1
C716		Electrolytic 2200 μ F 16V	1	VC101	4 224T 09300	Variable Capacitor	1
C847,947		Electrolytic 1000 μ F 16V	2	CT101	4 224R 11671	Trimmer	3
C845,945		Electrolytic 1000 μ F 10V	2	102			
C708		Electrolytic 470 μ F 10V	2	104			
C804,904		Electrolytic 220 μ F 16V	1	CT103	4 224T 08800	Trimmer	1
C849,949		Electrolytic 220 μ F 10V	2	L101	4 265R 11600	VHF Coil	1
C817,917		Electrolytic 100 μ F 16V	2	L106	4 265R 12600	VHF Coil	1
C714		Electrolytic 100 μ F 10V	2	L102	4 265R 00500	VHF Coil	1
C805,905		Electrolytic 22 μ F 10V	1	L103	4 265R 01200	VHF Coil	1
C838,938		Electrolytic 4.7 μ F 25V	2	L107	4 265R 10800	VHF Coil	1
C809,909		Electrolytic 3.3 μ F 25V	2	L104	4 265R 11700	VHF Coil	1
818,918		Electrolytic 1 μ F 25V	4	L105	4 265R 13500	VHF Coil	1
C820,920		Electrolytic 1 μ F 25V	4	T301	4 256R 20831	I.F.T	1
824,924		Electrolytic 1 μ F 25V	4	T302	4 256R 02131	I.F.T	1
C825,925		Electrolytic 1 μ F 25V	4	T303	4 256R 15131	I.F.T	1
829,929		Electrolytic 1 μ F 25V	4	T304	4 256R 02331	I.F.T	2
C826,926		Electrolytic 1 μ F 25V	4	T305,306	4 256R 00131	I.F.T	1
831,931		Electrolytic 470 μ F 16V	2	T307	4 256R 00231	I.F.T	
C828,928		Electrolytic 47 μ F 10V	4		4 256T 80400	I.F.Filter	
C707,729		Electrolytic 33 μ F 10V	2	CF301	4 256T 80471	I.F.Filter	1
841,941		Electrolytic 22 μ F 16V	2		4 256T 80473	I.F.Filter	
C715,732		Ceramic 0.0047 μ F 50V $\pm 10\%$	1	S101	4 231T 83900	Switch	1
C840,940		Ceramic 0.001 μ F 50V $\pm 10\%$	4	B101	123 2 471R 10900	Core	2
C921		Ceramic 0.001 μ F 50V $\pm 10\%$	2	CR501	4 227T 02300	CR Pack	
C815,915		Ceramic 680pF 50V $\pm 10\%$	2	SVR350	4 222T 39475	Semi Fixed Variable Resistor,	2
839,939		Ceramic 470pF 50V $\pm 10\%$	2	502		10K-B	
C731,730		Ceramic 270pF 50V $\pm 10\%$	2		141 2 322T 18900	Shield Plate	1
C811,911		Ceramic 220pF 50V $\pm 10\%$	1	IC501	141 2 322T 18100	Shield Plate	1
C851,951		Ceramic 100pF 50V $\pm 10\%$	2	Q102		IC AN7410	1
C843,943		Ceramic 82pF 50V $\pm 10\%$	2	Q103,301		Transistor 2SC930 E RF	2
C933		Ceramic 47pF 50V $\pm 10\%$	1	Q302		Transistor 2SC930 D2 Conv.	1
C806,906		Ceramic 0.0015 μ F 50V $\pm 10\%$	2	Q303		Transistor 2SC930 E IF	1
C830,930		AL Electrolytic 0.22 μ F 16V	2	Q304,305		Transistor 2SC930 D IF	2
C711		AL Electrolytic 0.1 μ F 16V	4	Q306,307		Transistor 2SC536 G	2
C803,903		+40-20%	2	Q101		Transistor 2SC536 G	1
C813,913		AL Electrolytic 0.1 μ F 16V	2	D104		Transistor 2SC930 D RF	1
C801,901		+40-20%	2	D304,305		Diode 1S553	2
C823,923		Mylar 0.15 μ F 50V $\pm 20\%$	2	D102,103		Diode 1S188 FM1	9
808,908		Mylar 0.1 μ F 50V $\pm 20\%$	2	105,301		Diode 1S2473	
C802,902		Mylar 0.047 μ F 50V $\pm 20\%$	2	302,303			
C848,948		Mylar 0.022 μ F 50V $\pm 20\%$	1	307,350			
C846,946		Mylar 0.022 μ F 50V $\pm 20\%$	2	352			
C819,919		Mylar 0.012 μ F 50V $\pm 20\%$	2	D306		Diode RD4.7E C	1
C812,912		Mylar 0.0082 μ F 50V $\pm 20\%$	1	D106		Diode MV11 T	1
C713		Mylar 820pF 50V $\pm 20\%$	1	D351,353		Diode 1S2473	2
C822,922		Ceramic 0.0033 μ F 50V $\pm 10\%$	1				
C814,914		Ceramic 180pF 50V $\pm 10\%$	2				
C712		Ceramic 100pF 50V $\pm 10\%$	1				
C821			1				
C807,907			2				
C736			1				
POWER SOURCE PCB ASS'Y							
103	141 4 230T 73072	P.C. Board Assembly Power Source	1	R110		Carbon 10 ohm $\pm 10\%$ $\frac{1}{4}$ W	1
	4 235T 35871	Socket AC/DC	1	R103		Carbon 33 ohm $\pm 10\%$ $\frac{1}{4}$ W	1
	141 2 135T 44900	Cover	1	R514		Carbon 180 ohm $\pm 10\%$ $\frac{1}{4}$ W	1
D706,707		Diode 1N4001	4	R311		Carbon 150 ohm $\pm 10\%$ $\frac{1}{4}$ W	1
713,714		Ceramic Cap. 0.022 μ F 50V	4	R111		Carbon 180 ohm $\pm 10\%$ $\frac{1}{4}$ W	1
C701,702		+80-20%		R351		Carbon 390 ohm $\pm 10\%$ $\frac{1}{4}$ W	1
703,704				R306		Carbon 330 ohm $\pm 10\%$ $\frac{1}{4}$ W	1
				R304,305		Carbon 560 ohm $\pm 10\%$ $\frac{1}{4}$ W	3
				308			
				R104		Carbon 820 ohm $\pm 10\%$ $\frac{1}{4}$ W	1
				R352,510		Carbon 820 ohm $\pm 10\%$ $\frac{1}{4}$ W	2
				R310,317		Carbon 1K ohm $\pm 10\%$ $\frac{1}{4}$ W	4
				502,511			
				R107		Carbon 1K ohm $\pm 10\%$ $\frac{1}{4}$ W	1
				R303,326		Carbon 1.5K ohm $\pm 10\%$ $\frac{1}{4}$ W	2
				R112		Carbon 5.6K ohm $\pm 10\%$ $\frac{1}{4}$ W	1
				R105		Carbon 5.6K ohm $\pm 10\%$ $\frac{1}{4}$ W	1
				R320		Carbon 6.8K ohm $\pm 10\%$ $\frac{1}{4}$ W	1
				R325		Carbon 220 ohm $\pm 10\%$ $\frac{1}{4}$ W	1
				R324		Carbon 10K ohm $\pm 10\%$ $\frac{1}{4}$ W	1
				R515,516		Carbon 2.2K ohm $\pm 10\%$ $\frac{1}{4}$ W	2
				R319		Carbon 8.2K ohm $\pm 10\%$ $\frac{1}{4}$ W	1
				R358		Carbon 10K ohm $\pm 10\%$ $\frac{1}{4}$ W	1
				R506,507		Carbon 5.6K ohm $\pm 10\%$ $\frac{1}{4}$ W	2
				R503		Carbon 18K ohm $\pm 10\%$ $\frac{1}{4}$ W	1
				R318,353		Carbon 39K ohm $\pm 10\%$ $\frac{1}{4}$ W	1
				R508		Carbon 27K ohm $\pm 10\%$ $\frac{1}{4}$ W	1
HEADPHONE PCB ASS'Y							
104	141 4 230T 73200	P.C. Board Assembly Headphone	1				
	4 235T 50100	Socket	1				
R848,948		Carbon Res 100 ohm $\pm 10\%$ $\frac{1}{4}$ W	2				
C850,950		Electrolytic Cap 4.7 μ F 16V	2				
		Nonpolar					

PARTS LIST

Key No.	Part No.	Description	Q'ty	Key No.	Part No.	Description	Q'ty
TUNER PCB ASS'Y				TUNER PCB ASS'Y			
		RESISTORS				CAPACITORS	
R501		Carbon 47K ohm $\pm 10\%$ $\frac{1}{4}W$	1	C512		Electrolytic 2200 μF 16V	1
R108,322		Carbon 100K ohm $\pm 10\%$ $\frac{1}{4}W$	2	C514		Electrolytic 1 μF 16V	1
R356,357		Carbon 100K ohm $\pm 10\%$ $\frac{1}{4}W$	2	LED PCB ASS'Y			
R101		Carbon 120K ohm $\pm 10\%$ $\frac{1}{4}W$	1	123	141 4 230T 82900	P.C. Board Assembly, LED	1
R102,301		Carbon 150K ohm $\pm 10\%$ $\frac{1}{4}W$	2	D501		LED SLP-131B-A or B or C Red	1
R350		Carbon 270K ohm $\pm 10\%$ $\frac{1}{4}W$	1	D354		LED SLP231B GR	1
R309		Carbon 270K ohm $\pm 10\%$ $\frac{1}{4}W$	1	CLOCK PCB ASS'Y			
R359		Carbon 330K ohm $\pm 10\%$ $\frac{1}{4}W$	1	124	141 4 230T 71501	P.C. Board Assembly, Clock	1
R302		Carbon 820K ohm $\pm 10\%$ $\frac{1}{4}W$	1	R1,2,3	4 221T 02700	Resistor	1
R321		Carbon 220K ohm $\pm 10\%$ $\frac{1}{4}W$	1	4,5	4 225T 01671	Crystal	1
R512		Carbon 27K ohm $\pm 10\%$ $\frac{1}{4}W$	1	X1	4-224T 12100	Trimmer	1
R307		Carbon 56K ohm $\pm 10\%$ $\frac{1}{4}W$	1	CT-1		LSI MPD 833GN	1
R353		Carbon 47K ohm $\pm 10\%$ $\frac{1}{4}W$	1	IC-1			
R508		Carbon 10K ohm $\pm 10\%$ $\frac{1}{4}W$	1	CLOCK SWITCH PCB ASS'Y			
R312		Carbon 270 ohm $\pm 10\%$ $\frac{1}{4}W$	1	C2,4		CAPACITORS	
R313,314		Carbon 1K ohm $\pm 10\%$ $\frac{1}{4}W$	2	C3,7,8		Tantal 0.22 μF 10V $\pm 20\%$	2
R315,316		Carbon 5.6K ohm $\pm 10\%$ $\frac{1}{4}W$	2	C1		Ceramic 0.001 μF 50V $\pm 10\%$	3
R323		Carbon 1K ohm $\pm 10\%$ $\frac{1}{4}W$	1	C6		BC CON 0.1 μF 12V +40-20%	1
R109		Carbon 100 ohm $\pm 10\%$ $\frac{1}{4}W$	1	C10		Ceramic 22pF 50V $\pm 10\%$	1
				C5		Ceramic 5pF 50V $\pm 0.5pF$	1
						Ceramic 0.0047 μF 50 +80-20%	1
		CAPACITORS		R9		RESISTORS	
C308		Ceramic 1pF 50V $\pm 0.25pF$	1	R6,7,8		Mini Carbon 1M ohm $\pm 10\%$ 1/8W	1
C309		Ceramic 3pF 50V $\pm 0.25pF$	1			Mini Carbon 1M ohm $\pm 10\%$ 1/8W	3
C108,116		Ceramic 4pF 50V $\pm 0.25pF$	2	CLOCK SWITCH PCB ASS'Y			
C301		Ceramic 7pF 50V $\pm 0.5pF$	1	125	141 2 230T 71600	P.C. Board Assembly, Clock	1
C112		Ceramic 7pF 50V $\pm 0.5pF$	1	S5	4 231T 47800	Special Switch	1
C115		Ceramic 10pF 50V $\pm 0.5pF$	1	S4-1	4 231T 47700	Switch	1
C350		Ceramic 2pF 50V $\pm 0.25pF$	1	4-2			
C351		Ceramic 5pF 50V $\pm 0.5pF$	1		141 2 382T 11100	Terminal	1
C102		Ceramic 10pF 50V $\pm 0.5pF$	1		141 2 467T 01604	Rivet, 2x3	3
C103		Ceramic 15pF 50V $\pm 10\%$	1	D1,2,3		Diode 1S2473	3
C109		Ceramic 16pF 50V $\pm 5\%$	1	R11		Mini Carbon 10K ohm $\pm 10\%$ 1/8W	1
C110		Ceramic 20pF 50V $\pm 10\%$	1				
C311		Ceramic 30pF 50V $\pm 10\%$	1				
C104		Ceramic 36pF 50V $\pm 10\%$	1				
C105		Ceramic 47pF 50V $\pm 10\%$	1				
C310		Ceramic 100pF 50V $\pm 10\%$	1				
C302		Ceramic 220pF 50V $\pm 10\%$	1				
C326,327		Ceramic 100pF 50V $\pm 10\%$	3				
328							
C314,315		Ceramic 220pF 50V $\pm 10\%$	3				
317							
C111		Ceramic 330pF 50V $\pm 10\%$	1				
C106,107		Ceramic 0.01 μF 50V +80-20%	4				
114,305							
C117,118		Ceramic 0.022 μF 50V +80-20%	6				
120,306							
319,320							
C353,354		Ceramic 0.022 μF 50V +80-20%	3				
355							
C304		Ceramic 0.04 μF 50V +80-20%	1				
C119		Ceramic 0.047 μF 50V +80-20%	1				
C307		BC CON 0.22 μF 12V $\pm 20\%$	1				
C356		Ceramic 0.022 μF 50V +80-20%	1				
C352,513		Ceramic 0.001 μF 50V $\pm 10\%$	2				
C330,331		Ceramic 100pF 50V $\pm 10\%$	2				
C329		Ceramic 0.001 μF 50V $\pm 10\%$	1				
C324		Electrolytic 470 μF 10V	1				
C325		Electrolytic 4.7 μF 10V	1				
C316,318		Electrolytic 4.7 μF 6.3V	2				
C503,506		AL Electrolytic 0.47 μF 10V +40-20%	2				
C504		AL Electrolytic 0.22 μF 10V +40-20%	1				
C510,511		AL Electrolytic 0.1 μF 10V +40-20%	2				
C507		Styrol 470pF 50V $\pm 5\%$	1				
C122		Styrol 120pF 50V $\pm 5\%$	1				
C323,502		Mylar 0.047 μF 50V $\pm 20\%$	2				
C321		Mylar 0.022 μF 50V $\pm 20\%$	1				
C508,509		Mylar 0.012 μF 50V $\pm 20\%$	2				
C303,312		Mylar 0.01 μF 50V $\pm 20\%$	3				
313							
C121		Mylar 0.0068 μF 50V $\pm 20\%$	1				
C322		Electrolytic 1 μF 6.3V	1				
C358		AL Electrolytic 0.1 μF 10V +40-20%	1				



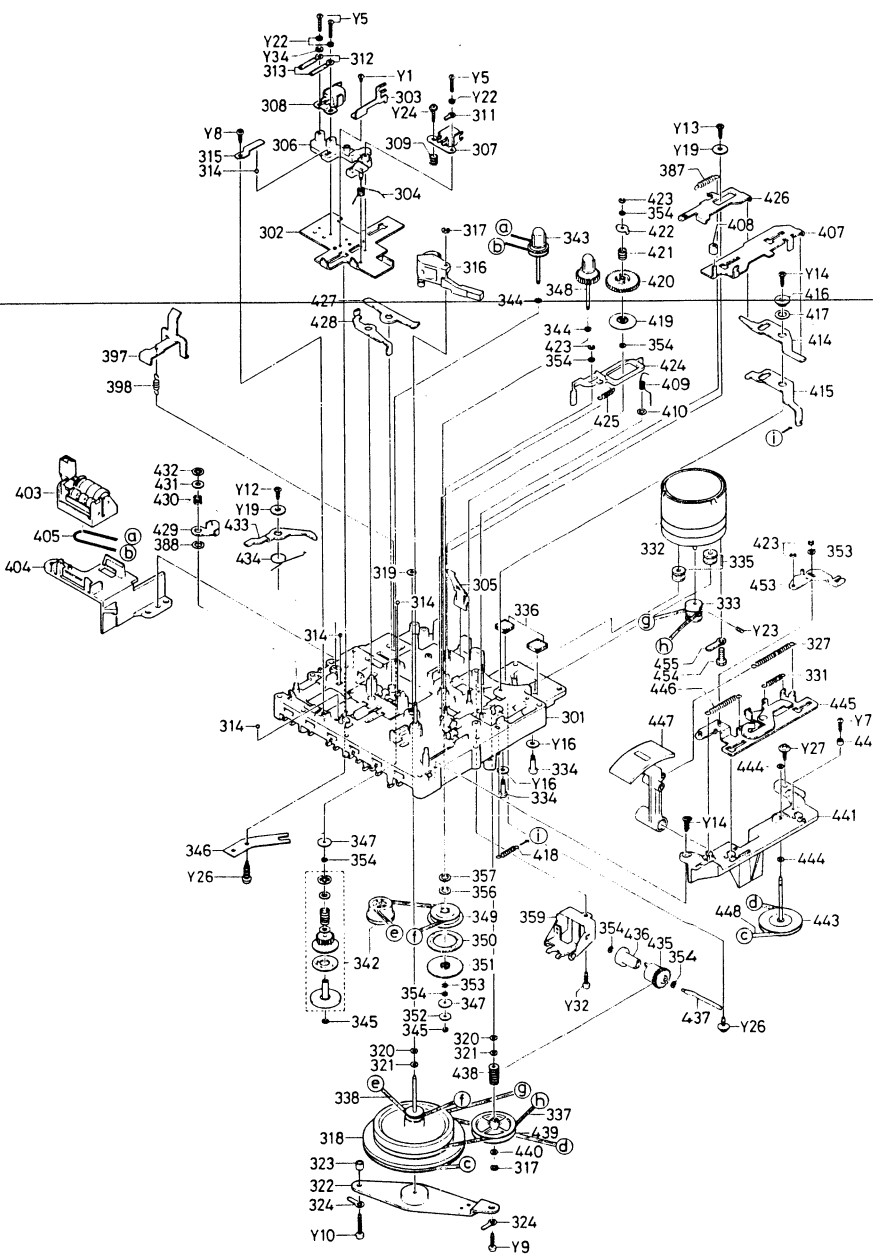
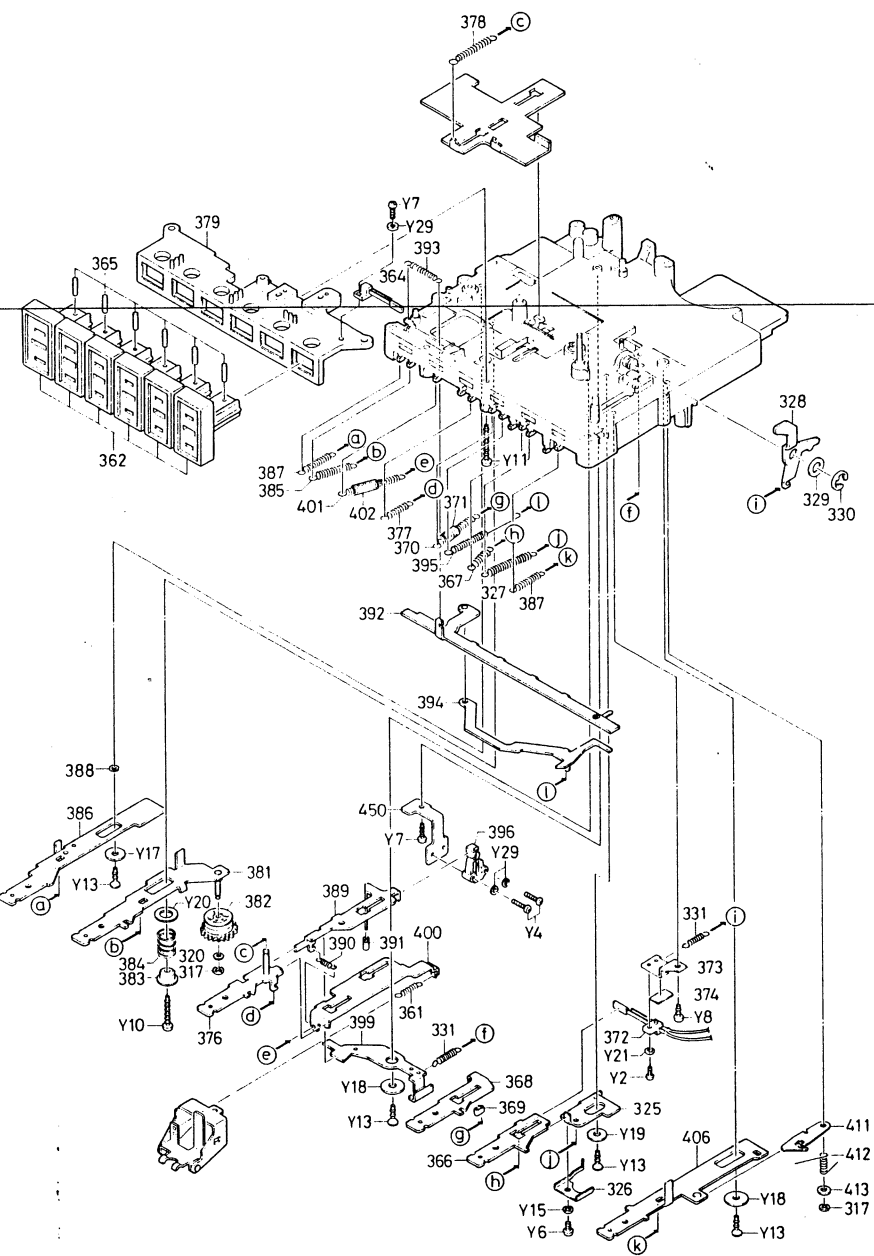
ARTS LIST

Key No.	Part No.	Description	Q'ty	Key No.	Part No.	Description	Q'ty
MECHANISM				MECHANISM			
301	141 0 311T 26220	Chassis Assy	1	377	141 2 855T 28800	Spring Coil	1
302	141 2 731T 37502	Slide, Head	1	378	141 2 851T 96400	Spring Coil	1
303	141 2 821T 10700	Tape Guide	1	379	141 2 351T 43300	Bracket Mounting	1
304	141 2 852T 43700	Spring Wire, Pinch Roller	1	381	141 0 731T 54500	Side Assy, REW (141-0-731T-16400)	1
305	141 2 853T 46901	Spring Plate, Cassette phase	1	382	141 2 661T 22600	Pulley, REW	1
306	141 2 375T 06900	Bracket, Head	1	383	141 2 461T 30200	Pipe	1
307	4 242T 21671	R/P Head	1	384	141 2 851T 65600	Spring Coil	1
308	4 242T 19500	E Head	1	385	141 2 855T 17400	Spring Coil	1
309	141 2 851T 82700	Spring Coil, R/P Head	1	386	141 2 731T 57800	Slide, REC	1
311	123 2 472R 00200	Lug	1	387	141 2 851T 93002	Spring Coil	3
312	141 2 472T 05900	Lug	2	388	141 2 453T 30700	Washer 5.2x8x0.13 Nylon	2
313	141 2 490T 00600	Tube	2	389	141 2 731T 43101	Slide	1
314	141 2 345T 00400	Steel Ball	4	390	141 2 855T 00200	Spring Coil	1
315	141 2 853T 53200	Spring Plate	1	391	141 2 490T 05000	Tube	6
316	141 0 545T 04720	Lever Pinch Roller (141-0-545T-02900)	1	392	141 0 731T 55100	Slide Assy, Button Lock (141 0 731T 16500)	1
317	141 2 457T 23000	Special Washer	4	393	141 2 851T 73800	Spring Coil	1
318	141 0 521T 09300	Flywheel Assy	1	394	141 2 742T 07100	Lever	1
319	141 2 457T 04300	Special Washer	1	395	141 2 851T 91200	Spring Coil	1
320	141 2 453T 30201	Washer 2.5x5x0.25 Nylon	3	396	4 231T 82600	Switch, Main	1
321	141 2 453T 30202	Washer 2.6x4.7x0.5 Nylon	1	397	141 2 742T 12500	Lever	1
322	141 0 524T 07800	Bracket Flywheel Assy	1	398	141 2 851T 87701	Spring Coil	1
323	141 2 683T 22800	Ring	1	399	141 2 742T 08100	Lever	1
324	123 2 472R 00400	Lug	2	400	141 2 731T 55300	Slide	1
325	141 2 742T 08201	Lever	1	401	141 2 855T 19600	Spring Coil	1
326	141 2 853T 52900	Spring Plate	1	402	141 2 490T 00900	Tube	1
327	141 2 851T 80100	Spring Coil	2	403	141 2 811T 06400	Counter	1
328	141 2 741T 96400	Lever	1	404	141 2 812T 07000	Bracket, Counter	1
329	141 2 453T 30802	Washer 6.2x9.5x0.5 Nylon	1	405	141 2 564T 18200	Square Belt	1
330	141 2 457T 23200	Special Washer	1	406	141 0 731T 54900	Slide Assy, Pouse Button	1
331	141 2 851T 56100	Spring Coil	3	407	141 2 731T 57600	Slide, Pouse	1
332	4 527T 10271	Motor	1	408	141 2 461T 30700	Pipe	1
333	141 2 661T 72500	Pully, Motor	1	409	141 2 852T 42800	Spring Wire	1
	141 2 661T 72501			410	141 2 457T 10300	Special Washer 3.2x5.7x0.1	1
	141 2 661T 72502	Special Screw, Motor	2	411	141 2 614T 05200	Lever Lock	1
334	141 2 421T 12501			412	141 2 852T 37900	Spring Wire	1
335	141 2 445T 07000	Rubber Cushion, Motor	2	413	141 2 453T 01200	Washer 3x8x1	1
336	141 2 447T 36000	Cushion, Motor	2	414	141 2 742T 07400	Lever, Pouse	1
337	141 2 564T 19800	Square Belt Main	1	415	141 2 742T 06900	Lever	1
338	141 2 564T 19700	Belt	1	416	141 2 461T 28700	Pipe	1
339	141 2 464T 08700	Fixer	1	417	141 2 453T 30800	Washer 6.2x9.5x0.13 Nylon	1
342	141 0 661T 22701	Pulley Assy, Supply (141-0-661T-02400)	1	418	141 2 855T 15100	Spring Coil	1
343	141 2 531T 10101	Reel Plate, Supply	1	419	141 2 661T 24300	Pulley	1
344	141 2 457T 11000	Special Washer	4	420	141 0 581T 09000	Gear Assy	1
345	141 2 457T 23700	Special Washer	2	421	141 2 855T 16500	Spring Coil	1
346	141 2 853T 48000	Spring Plate, Back Tention	1	422	141 2 858T 08100	Bracket, Spring	1
347	141 2 457T 06200	Special Washer, Back Tention	2	423	141 2 457T 23800	Special Washer	3
348	141 2 531T 10700	Reel Plate, Tack UP	1	424	141 2 731T 53400	Slide, Auto Stop	1
349	141 2 661T 22901	Pully, Tack Up	1	425	141 2 855T 15400	Spring Coil	1
350	141 2 452T 02300	Felt	1	426	141 2 731T 54200	Slide, Rev	1
351	141 2 661T 23001	Pulley, Tack Up	1	427	141 2 742T 07500	Lever, Rev	1
352	141 2 453T 31200	Washer 2x8.5x0.25 Poly	1	428	141 2 742T 07600	Lever, Cue	1
353	141 2 453T 30106	Washer 2.1x4x0.13 Nylon	2	429	141 2 742T 07900	Lever, Rec	1
354	141 2 453T 30101	Washer 2.1x4x0.25 Nylon	4	430	141 2 852T 45400	Spring Wire	1
355	141 2 453T 32400	Washer 4.9x8x0.13 Nylon	1	431	141 2 453T 00800	Washer 3x8x0.5	1
356	141 2 453T 32401	Washer 4.9x8x0.25	1	432	141 2 457T 20100	Special Washer	1
357	141 2 445T 21200	Rubber Cushion	1	433	141 2 742T 08000	Lever	1
358	141 0 742T 07000	Lever Assy	1	434	141 2 852T 43300	Spring Wire	1
	141 2 851T 96200	Spring Coil	1	435	141 2 581T 09100	Gear, Auto Stop	1
	141 2 855T 01900	Spring Coil		436	141 2 661T 24400	Pulley, Auto Stop	1
361	141 2 855T 12400	Spring Coil		437	141 2 753T 20800	Shaft	1
	141 2 855T 19900	Spring Coil		438	141 2 581T 01900	Gear	1
	141 2 855T 28700	Spring Coil	6	439	141 0 661T 25300	Pulley Assy	1
362	141 2 161T 48800	Push Button		440	141 2 453T 30200	Washer 2.6x4.7x0.13 Nylon	2
364	4 231T 50900	Switch, Stand by	1	441	141 0 312T 15300	Sub Chassis Assy	1
365	141 2 488T 01801	Pin	6	442	141 2 461T 32800	Pipe	1
366	141 2 731T 55000	Slide, Stop Button	1	443	141 0 661T 13200	Pully Assy	1
367	141 2 855T 29900	Spring Coil	1	444	141 2 453T 30001	Washer 1.7x3.2x0.25	1
368	141 2 731T 54300	Slide, FF Button	1	445	141 0 731T 57700	Slide Assy	1
369	141 2 490T 00500	Tube	3	446	141 2 851T 63800	Spring Coil	1
370	141 2 855T 29800	Spring Coil	1	447	141 0 741T 12700	Lever Assy	1
371	141 2 490T 01100	Tube 5φx10mm	1	448	141 2 564T 19500	Square Belt	1
372	4 231T 68000	Switch	3	449	141 2 322T 31401	Shield Plate	1
373	141 2 365T 37900	Bracket, Switch	1	450	141 2 365T 41300	Bracket Switch	1
374	141 2 352T 26900	Spacer	1	453	141 2 742T 22200	Lever	1
376	141 0 731T 54400	Slide Assy (141-0-731T-16300)	1	454	141 2 421T 22100	Special Screw, Motor	1
				455	123 2 472R 00400	Lug, Motor	1

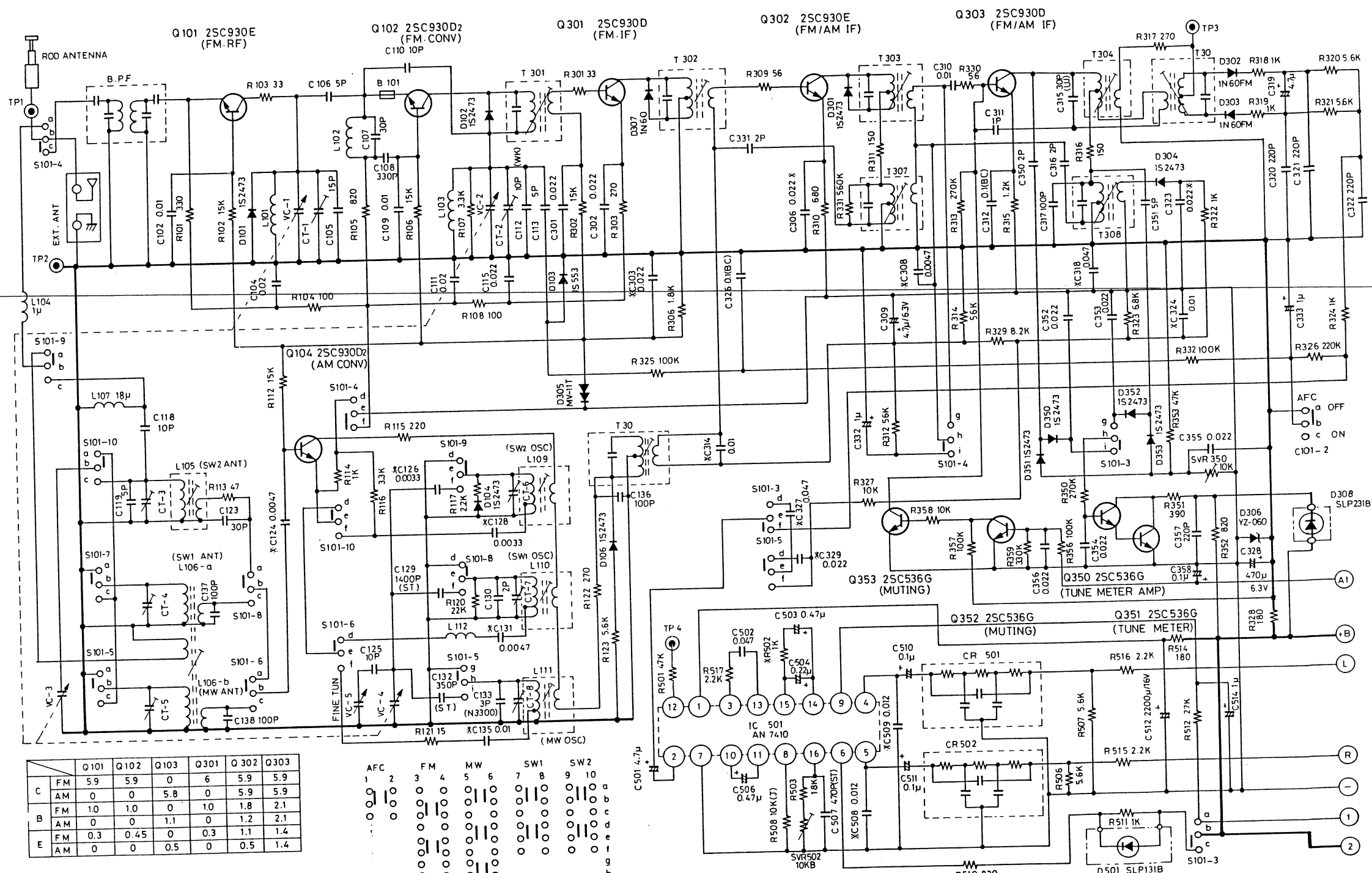
PARTS LIST

EXPLODED VIEW (MECHANISM)

Key No.	Part No.	Description	Q'ty
MECHANISM SCREWS			
Y1		Pan Hd. Screw 2x2	1
Y2		Pan Hd. Screw 2x4	1
Y4		Pan Hd. Screw 2.6x6	2
Y5		Pan Hd. Screw 2x12	3
Y6		Pan Hd. Screw 2.6x4	1
Y7		Pan Hd. Tapping Screw 2.3x8	2
Y8		Pan Hd. Tapping Screw 3x6	2
Y9		Pan Hd. Tapping Screw 3x10	1
Y10		Pan Hd. Tapping Screw 3x14	2
Y11		Pan Hd. Tapping Screw 3x20	1
Y12		Pan Hd. Tapping Screw 3x6	1
Y13		Flat Hd. Tapping Screw 3x8	5
Y14		Flat Hd. Tapping Screw 3x10	2
Y15		Washer 2.6x5x0.5	1
Y16		Washer 3x8x0.5	2
Y17		Washer 3x10x1	1
Y18		Flat Hd. Wood Screw 3x12	2
Y19		Washer 4x10x0.8	3
Y20		Washer 6x11.5x0.8	1
Y21		Washer 2x4.8x0.3	1
Y22		Spring Washer 2	3
Y23		Head Less Screw 2x3	1
Y24		Pan Hd. Screw W/Washer 2x12	1
Y26		Pan Hd. Tapping Screw W/Washer 3x6	2
Y27		Pan Hd. Tapping W/Washer 3x10	1
Y29		Washer 2x4.3x0.3	1
Y30		Pan Hd. Tapping Screw 2.3x6	1
Y31		Nut 2mm	2
Y32		Pan Hd. Tapping Screw 3x8	1
Y34		Washer 2m	1
Y35		Washer 3.5m	2



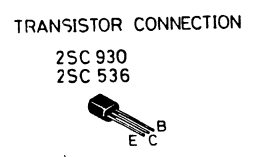
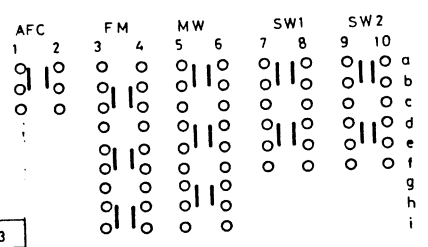
SCHEMATIC DIAGRAM (TUNER)



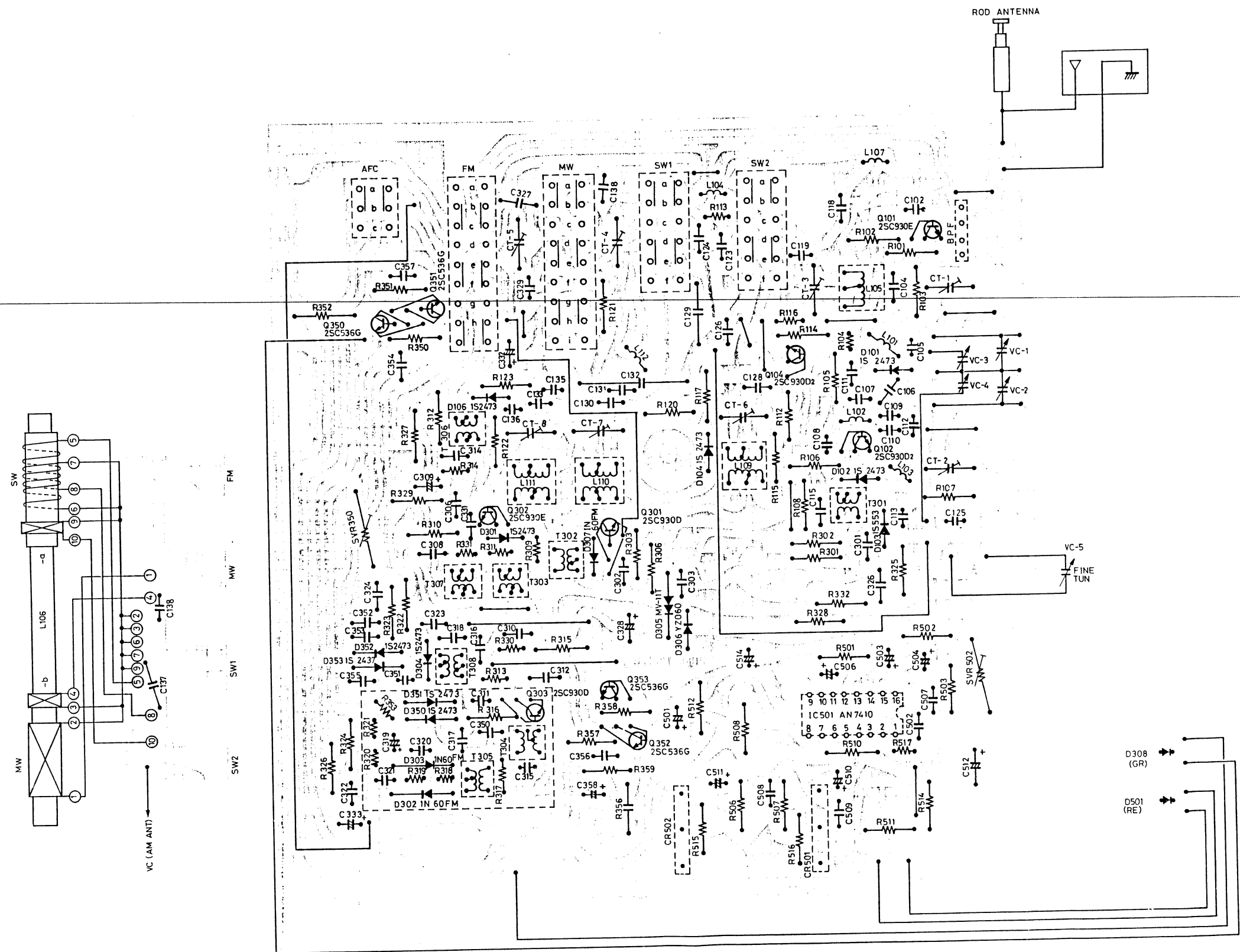
	Q101	Q102	Q103	Q301	Q302	Q303
C	FM 5.9	5.9	0	6	5.9	5.9
AM	0	0	5.8	0	5.9	5.9
B	FM 1.0	1.0	0	1.0	1.8	2.1
AM	0	0	1.1	0	1.2	2.1
E	FM 0.3	0.45	0	0.3	1.1	1.4
AM	0	0	0.5	0	0.5	1.4

	Q305	Q351
C	LED OFF 11V	11V
LED ON	0.8	0.8
B	LED OFF 0	0
LED ON	0.6	0.7
E	LED OFF 0	0
LED ON	0.7	0

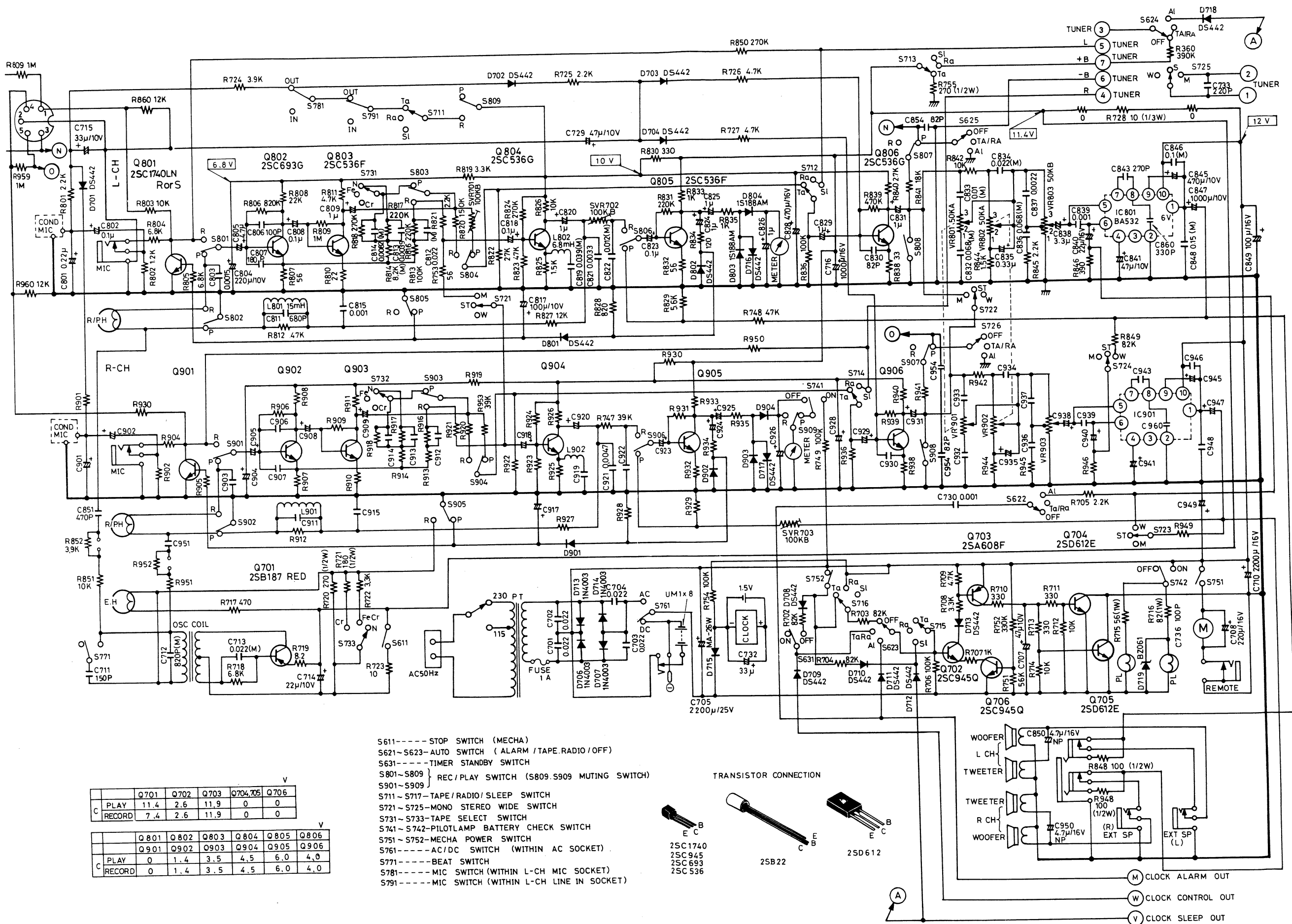
	Q352	Q353
C	RADIO 0.1	1.1
BUZZER	0.2	0.1
B	RADIO 0.6	0
BUZZER	0	0.1
E	RADIO 0	0
BUZZER	0	0



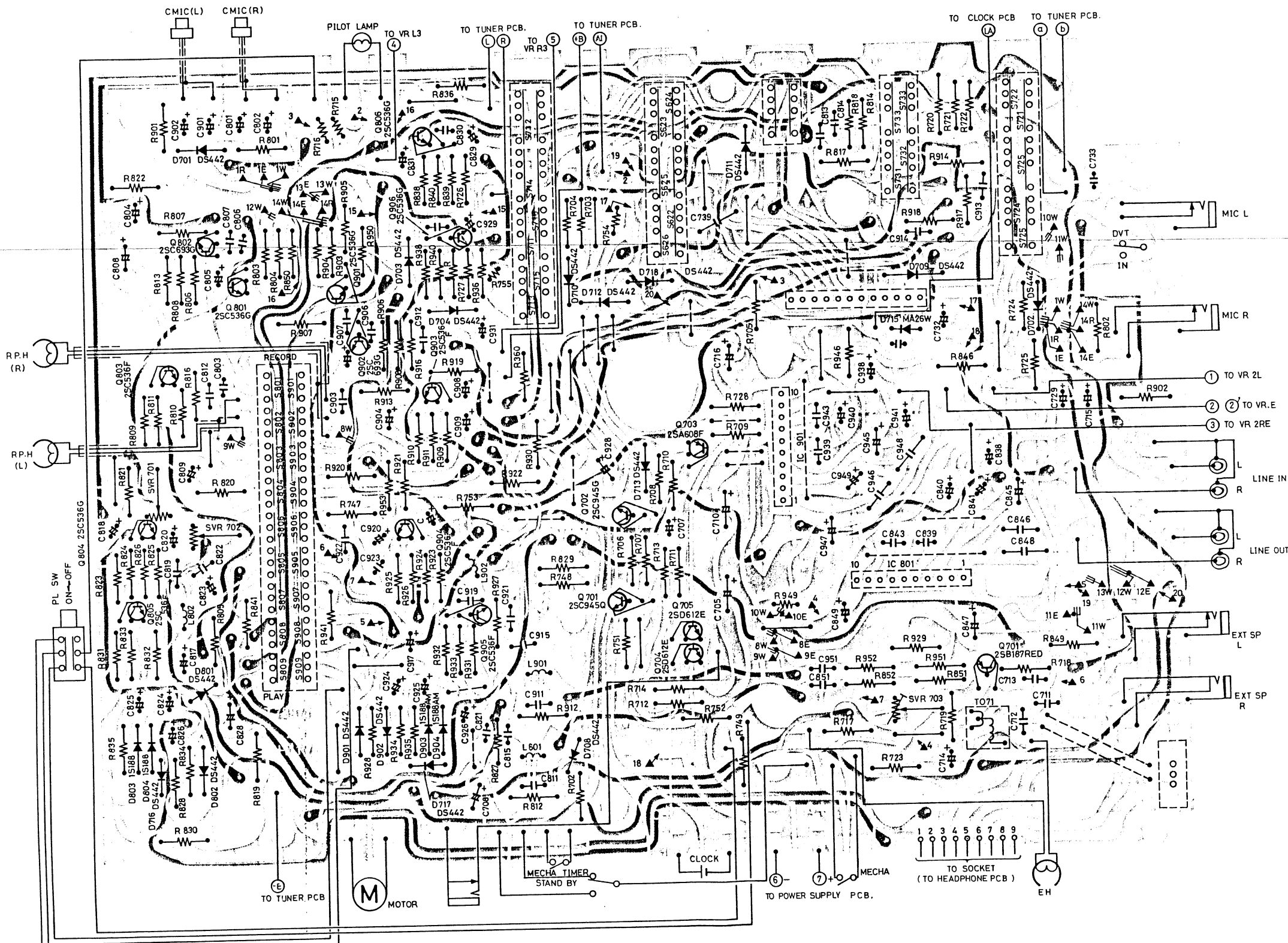
WIRING DIAGRAM (TUNER)



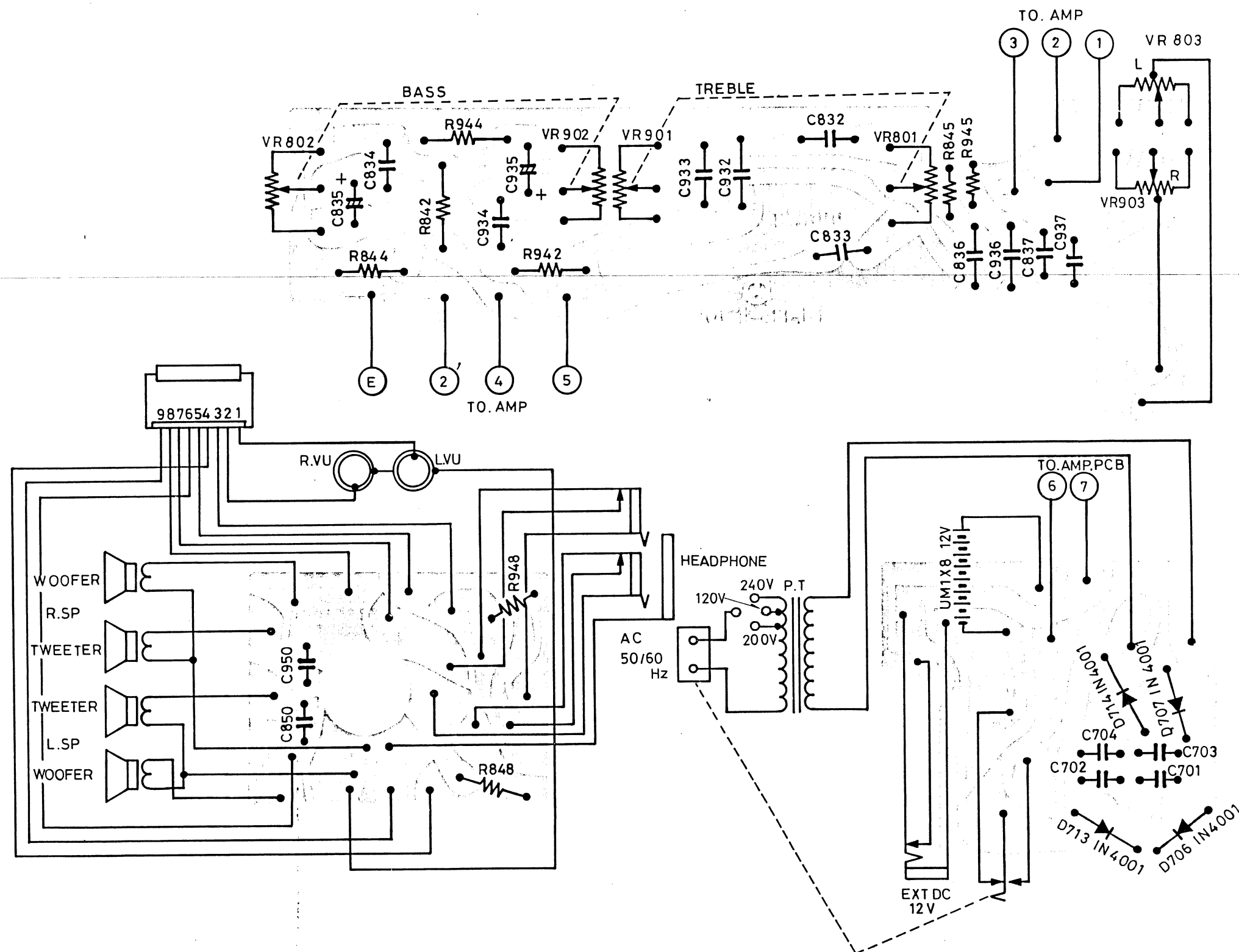
SCHEMATIC DIAGRAM (AMPLIFIER)

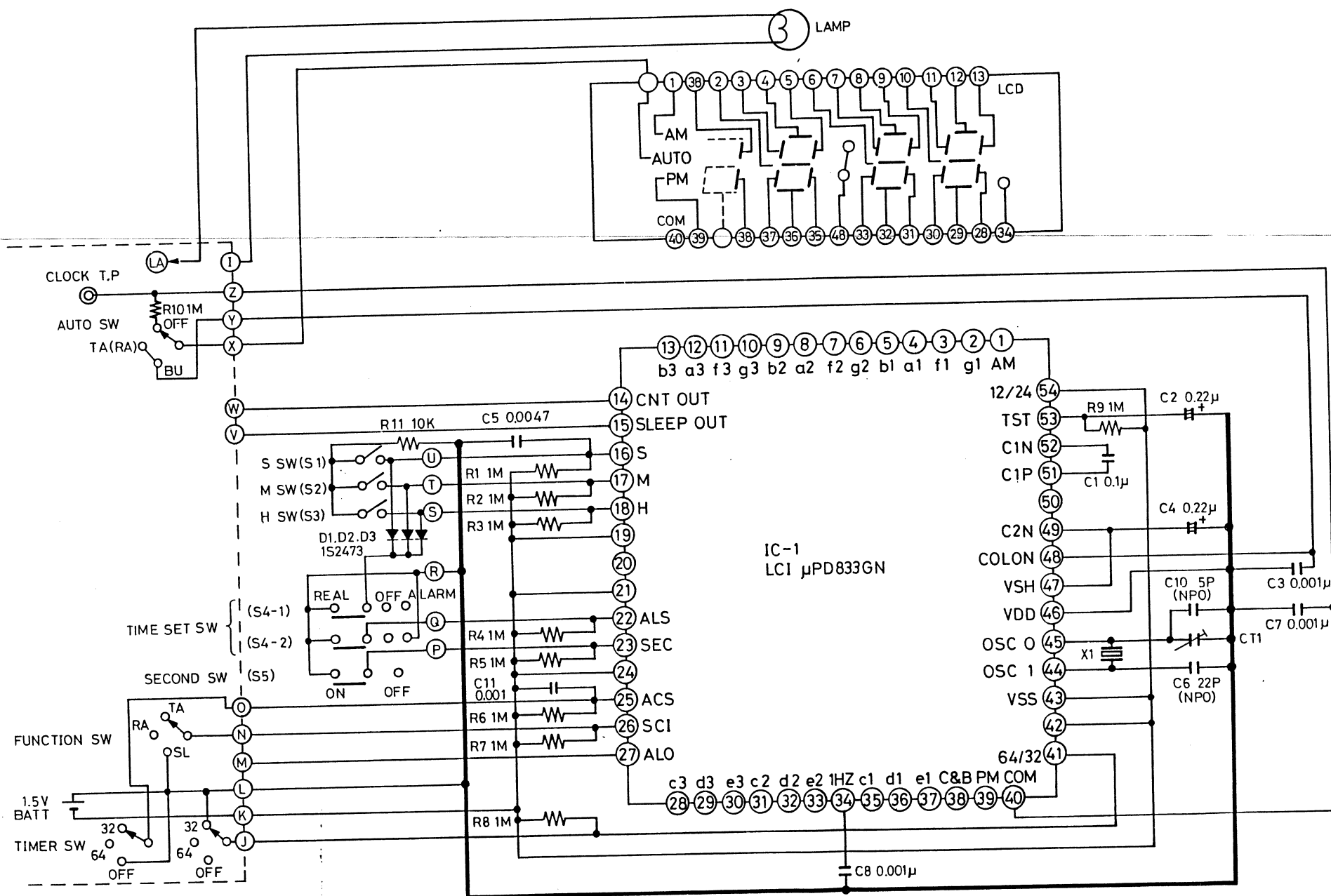


WIRING DIAGRAM (AMPLIFIER)

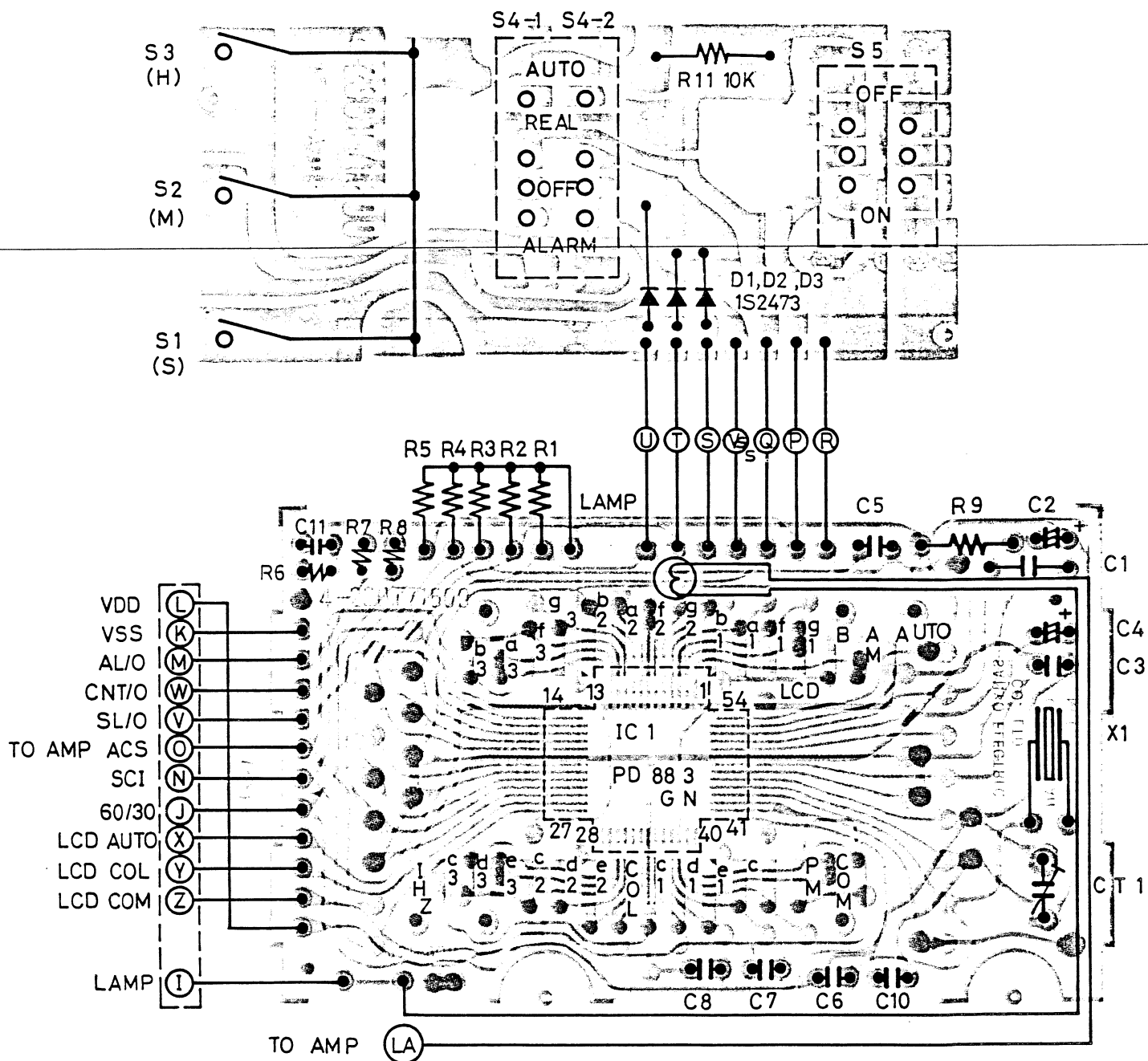


WIRING DIAGRAM





WIRING DIAGRAM (CLOCK)



MODIFICATION NOTICE

CASSETTE RECORDER



M 9990 (USA) M 9990LU
 M 9990K M 9990LG
 M 9990 (Canada)
 M 9990K (Aus)

Date Feb. 12, 1980 Issued by _____

The following corrections should be made in the SERVICE MANUALS and PARTS (PRICE) LIST.

		Section	Key No.	Part No.	Description	Q'ty	Remark	Reason
1	From	Clock PCB	125	141-2-230T-71600	PCB Assy, Clock	1		E
	To	Assy	125	141-4-230T-71600	PCB Assy, Clock	1		
2	From							
	To							
3	From							
	To							
INTERCHANGEABLE NOT INTERCHANGEABLE					Serial No. Chassis No.	Effective from		
Q'ty of initial production before modification.					Identification of modified unit.			
REASON FOR MODIFICATION A Standardization C Improvement of reliability E Miss print G B Change of materials D Improvement of performance F Miss register								

MODIFICATION NOTICE

CASSETTE RECORDER

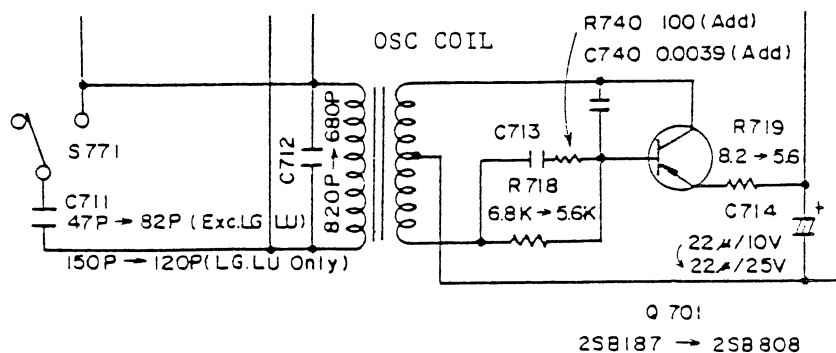


M 9990 (USA)	M 9990LU
M 9990 (CANADA)	M 9990LG
M 9990K (AUSTRALIA)	M 9990K

Date Apr. 20, 1981 Issued by _____

The following corrections should be made in the SERVICE MANUALS and PARTS (PRICE) LIST.

	From	To	
102	141-4-230T-72971	141-4-230T-72971-5	P.C. Board Assy. (USA)
102	141-4-230T-72972	141-4-230T-72972-5	P.C. Board Assy (CANADA, AUSTRALIA, GENERAL)
102	141-4-230T-72973	141-4-230T-72973-5	P.C. Board Assy (LG, LU)
Q701	2SB187	2SB808	Transistor
R718	6.8K ohm	5.6K ohm	Carbon Resistor
R719	8.2 ohm	5.6 ohm	"
R740		100 ohm	" (Add)
C711	47pF	82pF	Ceramic Cap. (US/CAN/AUS/K)
C711	150pF	120pF	Ceramic Cap (LG, LU)
C712	820pF	680pF	Mylar Cap.
C714	22μF 10V	22μF 25V	Elect. Cap.
C740		0.0039μF	Mylar Cap. (Add)



~~INTERCHANGEABLE~~	NOT INTERCHANGEABLE	Serial No.	Effective from
		Chassis No.	
Qty of initial production before modification.		Identification of modified unit.	
REASON FOR MODIFICATION			
A Standardization	C Improvement of reliability	E Miss print	G Change of Transistor
B Change of materials	D Improvement of performance	F Miss register	

MODIFICATION NOTICE

CASSETTE RECORDER

E-0427



M 9990 (USA)	WM-3546
M 9990LG (UK)	WM-4199
M 9990LU (EUROPE)	WM-4184
M 9990 (CANADA)	WM-4088
M 9990K (AUSTRALIA)	WM-3868
M 9990K	WM-3692

Date Apr. 30. 1983 Issued by _____

The following corrections should be made in the SERVICE MANUALS and PARTS (PRICE) LIST.

		Section	Key No.	Part No.	Description	Q'ty	Remark	Reason
1	From	Mechanism	447	141-0-741T-12700	Lever Assy			E
	To		"	141-2-742T-12700	Lever			
2	From							
	To							
3	From							
	To							

INTERCHANGEABLE	NOT INTERCHANGEABLE	Serial No. Chassis No.	Effective from
Q'ty of initial production before modification.		Identification of modified unit.	

REASON FOR MODIFICATION

A Standardization	C Improvement of reliability	E Miss print	G
B Change of materials	D Improvement of performance	F Miss register	

E-0487

MODIFICATION NOTICE

CASSETTE RECORDER

**SANYO**

M 9990K

Date Apr. 16, 1979 Issued by _____

The following corrections should be made in the SERVICE MANUALS and PARTS (PRICE) LIST.

Parts list of TUNER PCB assembly given on Pages 12 and 13 of Service Manual for Model M9990K (WM-3692) has been found misprinted. Consequently, we shall correct this parts-list as given on the next page.

INTERCHANGEABLE	NOT INTERCHANGEABLE	Serial No. Chassis No.	Effective from
Q'ty of initial production before modification.		Identification of modified unit.	
REASON FOR MODIFICATION A Standardization C Improvement of reliability E Miss print G B Change of materials D Improvement of performance F Miss register			

PARTS LIST

Key No.	Part No.	Description	Q'ty
TUNER PCB ASS'Y			
CT3,4,1, 6,7,8 CT5,2 L105 L109 L110 L111 L112 L101 L102 L103 T301 T302 T303 T304 T305 T306,307 T308 L104 L107	141 4 230T 82800	P.C. Board Assembly, Tuner	1
	4 224T 09400	Variable Capacitor	1
	4 224R 11671	Trimmer	6
	4 224T 08800	Trimmer	2
	4 257T 28630	Ant Coil, SW2	1
	4 258T 10230	OSC Coil, SW2	1
	4 258T 07640	OSC Coil, SW1	1
	4 258T 05640	OSC Coil, MW	1
	4 265R 00600	VHF Coil	1
	4 265R 11300	VHF Coil	1
	4 265R 12600	VHF Coil	1
	4 265T 02600	VHF Foil	1
	4 256R 20831	I.F.T	1
	4 256R 19531	I.F.T	1
	4 256R 19531	I.F.T	1
	4 256R 15131	I.F.T	1
	4 256R 02331	I.F.T	1
	4 256R 00131	I.F.T	2
	4 256R 00231	I.F.T	1
	4 253T 10800	Filter, 1μF	1
	4 253T 10815	Filter, 18μF	1
CR501, 502 SVR350, 502	123 2 471R 10900	Core	1
	4 231T 77500	Switch	1
	4 227T 02300	CR Pack	2
	4 222T 39475	Semifixed Variable Resistor 10K-B	2
	141 2 322T 18900	Shield Plate	1
	4 253T 08700	Filter	1
		Transistor 2SC930 E R	1
		Transistor 2SC930 D2, Conv.	2
		Transistor 2SC930 E, IF	1
		Transistor 2SC930 D, IF	2
Q101 Q102,103 Q302 Q301,303 Q350,351 352,353 D103 D302,303 D101,102, 104,106, 301,304 D350,351, 352,353 D305 D306 D307 IC501		Transistor 2SC536 G	4
		Diode 1S553	1
		Diode 1S188 FM or 1N60	2
		Diode 1S2473 or DS442X	6
		Diode 1S2473 or DS442X	4
		Diode MV-11T	1
		Diode Y2060	1
		Diode 1N60 FM	1
		IC AN7410	1
RESISTORS			
R103 R352 R310 R329 R113 R309,330 R104 R311 R317 R318,319 R116 R320,321 R353 R314 R313 R331 R517 R121 R108 R316 R328,514 R115 R122,303 R101 R351 R105,510 R114,322, 324,502 511		Carbon 33 ohm ±10% ¼W	1
		Carbon 820 ohm ±10% ¼W	1
		Carbon 680 ohm ±10% ¼W	1
		Carbon 8.2K ohm ±10% ¼W	1
		Carbon 47 ohm ±10% ¼W	1
		Carbon 56 ohm ±10% ¼W	2
		Carbon 100 ohm ±10% ¼W	1
		Carbon 150 ohm ±10% ¼W	1
		Carbon 270 ohm ±10% ¼W	1
		Carbon 1K ohm ±10% ¼W	2
		Carbon 3.3K ohm ±10% ¼W	1
		Carbon 5.6K ohm ±10% ¼W	2
		Carbon 47K ohm ±10% ¼W	1
		Carbon 56K ohm ±10% ¼W	1
		Carbon 270K ohm ±10% ¼W	1
		Carbon 560K ohm ±10% ¼W	1
		Carbon 2.2K ohm ±10% ¼W	1
		Carbon 15 ohm ±10% ¼W	1
		Carbon 100 ohm ±10% ¼W	1
		Carbon 150 ohm ±10% ¼W	1
		Carbon 180 ohm ±10% ¼W	2
		Carbon 220 ohms ±10% ¼W	1
		Carbon 270 ohm ±10% ¼W	2
		Carbon 330 ohm ±10% ¼W	1
		Carbon 390 ohm ±10% ¼W	1
		Carbon 820 ohm ±10% ¼W	2
		Carbon 1K ohm ±10% ¼W	5

Key No.	Part No.	Description	Q'ty
TUNER PCB ASS'Y			
RESISTORS			
R315 R306 R515,516, 117 R107 R123,506, 507 R323 R327,358 R508 R102,106, 112,302 R503 R120 R512 R501 R312 R325,332, 356,357 R326 R350 R359 R301		Carbon 1.2K ohm ±10% ¼W	1
		Carbon 1.8K ohm ±10% ¼W	1
		Carbon 2.2K ohm ±10% ¼W	3
		Carbon 3.3K ohm ±10% ¼W	1
		Carbon 5.6K ohm ±10% ¼W	3
		Carbon 6.8K ohm ±10% ¼W	1
		Carbon 10K ohm ±10% ¼W	2
		Carbon 10K ohm ±5% ¼W	1
		Carbon 15K ohm ±10% ¼W	4
		Carbon 18K ohm ±10% ¼W	1
		Carbon 22K ohm ±10% ¼W	1
		Carbon 27K ohm ±10% ¼W	1
		Carbon 47K ohm ±10% ¼W	1
		Carbon 56K ohm ±10% ¼W	1
		Carbon 100K ohm ±10% ¼W	4
		Carbon 220K ohm ±10% ¼W	1
		Carbon 270K ohm ±10% ¼W	1
		Carbon 330K ohm ±10% ¼W	1
		Carbon 33 ohm ±10% ¼W	1
CAPACITORS			
C311 C130,316, 331 C350 C133 C106,113, 351 C119 C110,118, 125 C112 C105 C107,123 C315 C136,317 C320,321, 322,357 C108 C102,109, 310 C104,111, 115,301, 302 C352,353, 354,355, 356 C137,138 C514 C309,319, 501 C328 C512 C358,510, 511 C504 C503,506 C132 C507 C129 C126,128 C124,131, 308 C135,314, 324 C508,509 C303,323, 306,329 C318,327, 502 C312,326 C332,333		Ceramic 1pF 50V ±0.25pF	1
		Ceramic 2pF 50V ±0.25pF	3
		Ceramic 2pF 50V ±0.25pF	1
		Ceramic 3pF 50V ±0.25pF	1
		Ceramic 5pF 50V ±0.25pF	3
		Ceramic 5pF 50V ±0.25pF	1
		Ceramic 10pF 50V ±0.25pF	3
		Ceramic 10pF 50V ±5%	1
		Ceramic 15pF 50V ±10%	1
		Ceramic 30pF 50V ±10%	2
		Ceramic 30pF 50V ±10%	1
		Ceramic 100pF 50V ±10%	2
		Ceramic 220pF 50V ±10%	4
		Ceramic 330pF 50V ±10%	1
		Ceramic 0.01μF 50V +80-20%	
		Ceramic 0.022μF 50V +80-20%	5
		Ceramic 0.022μF 50V +80-20%	5
		Ceramic 100pF 50V ±10%	2
		Electrolytic 1μF 16V	1
		Electrolytic 4.7μF 10V	3
		Electrolytic 470μF 10V	1
		Electrolytic 2200μF 16V	1
		AL Electrolytic 0.1μF 10V +40-20%	3
		AL Electrolytic 0.22μF 10V +40-20%	1
		AL Electrolytic 0.47μF 10V	2
		Styrol 350pF 50V ±5%	1
		Styrol 470pF 50V ±5%	1
		Styrol 1400pF 50V ±5%	1
		Mylar 0.0033μF 50V ±20%	2
		Mylar 0.0047μF 50V ±20%	3
		Mylar 0.01μF 50V ±20%	3
		Mylar 0.012μF 50V ±20%	2
		Mylar 0.022μF 50V ±20%	4
		Mylar 0.047μF 50V ±20%	3
		BC-CON 0.1μF 12V ±20%	2
		Electrolytic 1μF 6.3V	2

E-0487

MODIFICATION NOTICE

CASSETTE RECORDER



SANYO

M 9990 (USA)
 M 9990 (CANADA)
 M 9990K (AUSTLARIA)
 M 9990K

Date Oct. 31, 1982 Issued by _____

The following corrections should be made in the SERVICE MANUALS and PARTS (PRICE) LIST.

		Section	Key No.	Part No.	Description	Q'ty	Remark	Reason
1	From	Mechanism	358	141-0-742T-07000	Lever Assy			E
	To		359	"	"			
2	From							
	To							
3	From							
	To							
INTERCHANGEABLE NOT INTERCHANGEABLE Q'ty of initial production before modification.						Serial No. Chassis No.	Effective from Identification of modified unit.	
REASON FOR MODIFICATION A Standardization B Change of materials C Improvement of reliability D Improvement of performance E Miss print F Miss register G								